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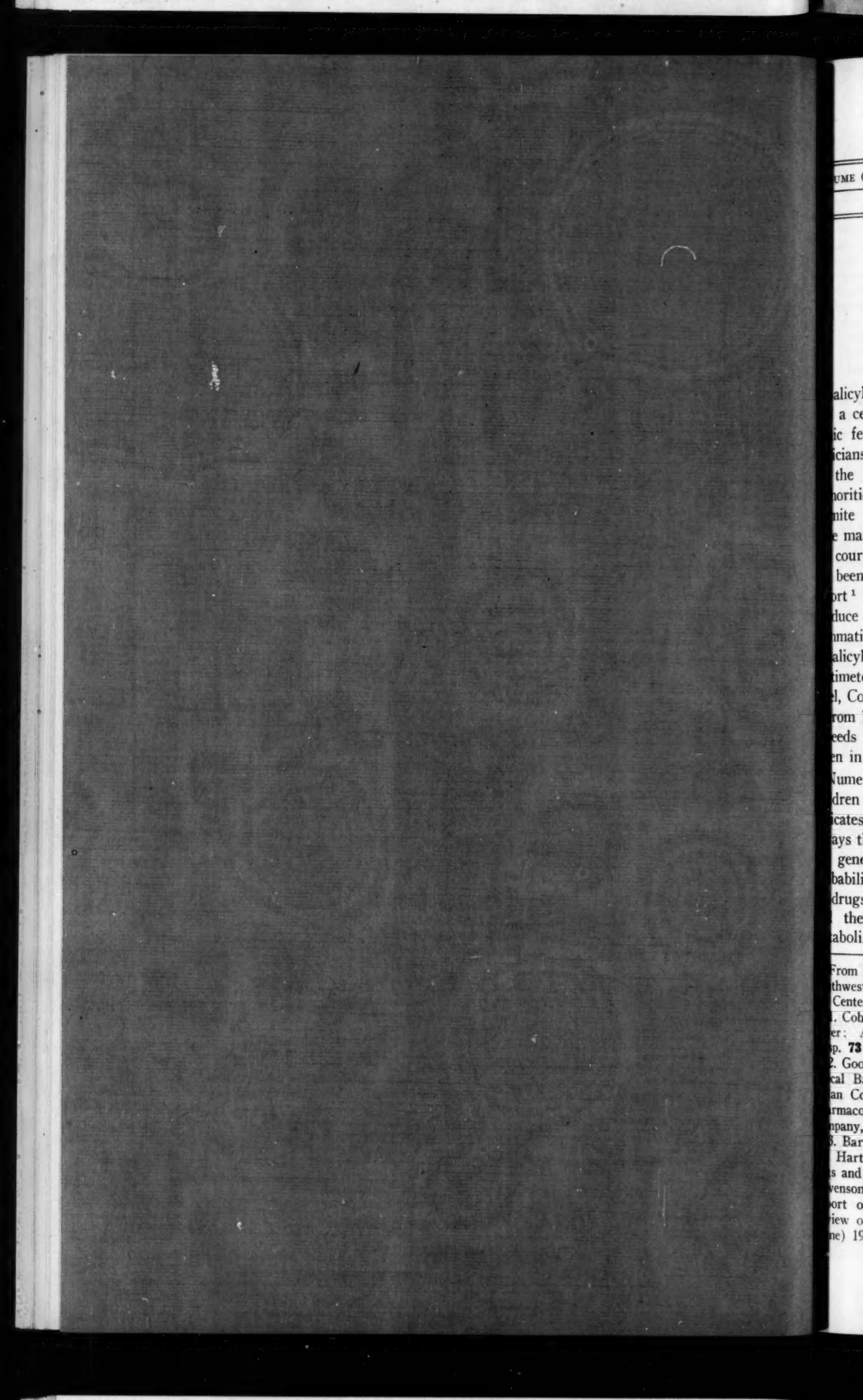

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SALICYLATE INTOXICATION

STUDIES ON THE EFFECTS OF SODIUM SALICYLATE ON PROTHROMBIN TIME AND ALKALI RESERVE

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DALLAS, TEXAS

alicylate therapy has been in use for over a century for the treatment of acute rheuic fever, and opinions have varied among icians as to the mode of action and the value the salicyl compounds. Although most norities have agreed that these drugs exert nite antipyretic and analgesic actions, few e maintained that salicylates actually modify course of the disease. Tremendous interest been aroused, therefore, by Coburn's recent ort [1] that massive doses of sodium salicylate duce a prompt subsidence of rheumatic inmation if a level of blood salicyl (measured alicylic acid) above 350 micrograms per cubic timeter is maintained. To maintain such a l, Coburn advocated the daily administration rom 10 to 20 Gm. of the drug. This amount eeds the toxic and even the fatal dose as n in some textbooks of pharmacology.[2]

Numerous reports of salicylate poisoning in dren have appeared in the literature,[3] which icates that the salicyl compounds are not ays the harmless household remedy that they generally thought to be. In view of the bability of greatly increased use of this group drugs in the treatment of rheumatic fever the observation that rheumatic patients abolize salicylic acid in a different manner from normal persons,[4] it seems pertinent to report a case of salicylate poisoning occurring during the treatment by the Coburn method of a patient with acute rheumatic fever.

REPORT OF A CASE

V. R. G., a 9 year old Negro boy, was admitted to the hospital on May 23, 1944, with pain in the lower parts of the legs and calves for four days as the chief complaint.

History.—The family history was noncontributory. The patient's history was also irrelevant except for the fact that he had had several bouts of mild fever associated with pharyngitis during the preceding winter. These attacks had lasted for one or two days and had been associated with pain in the lower parts of the legs but with no pain in the joints. Tonsillectomy had been performed in 1937. An injury to the left eyeball with hemorrhage into the anterior chamber had been sustained in May 1943.

The present illness began with mild pharyngitis and fever four days before the patient's admission to the hospital. At the same time aching pain in the calves and the lower parts of the legs was noted. The pain in the calves persisted and became slightly worse each day. The patient vomited once on the day before admission and had one large, watery, green stool without pus or blood on that day.

Physical Examination.—Physical examination at the time of his entry into the hospital revealed a well developed and nourished Negro boy, who did not appear acutely ill. His temperature was 102 F. His pulse rate was 88 per minute and his respiratory rate 22. There was an opacity of the left cornea 2 mm. in diameter; the left pupil was elliptic in its vertical axis and did not respond to light or in accommodation. The ears, nose and throat were not unusual except for a few tags of lymphoid hyperemic tissue in the tonsillar fossae. The neck was supple, the expansion and the external appearance of the chest were within normal limits and the lungs were entirely clear to percussion and auscultation. The heart was not enlarged to percussion, and the point of maximal apical impulse was felt in the fifth interspace 1.5 cm. within the midclavicular line. Regular sinus rhythm was present, the heart sounds were of good quality and no murmurs were heard. The abdomen was soft and flat, and the tip of the spleen was felt 1 cm. below the costal margin on deep inspiration. There was

From the Departments of Pathology and Pediatrics, thwestern Medical College, and the Children's Medi- Center.

1. Coburn, A. F.: Salicylate Therapy in Rheumatic er: A Rational Technique, Bull. Johns Hopkins p. **73**:435-464 (Dec.) 1943.

2. Goodman, L., and Gilman, A.: The Pharmacocal Basis of Therapeutics, New York, The Macan Company, 1941. Sollmann, T.: A Manual of rmacology, ed. 5, Philadelphia, W. B. Saunders npany, 1936.

3. Barnett, H. L.; Powers, J. R.; Benward, J. H., Hartmann, A. F.: Salicylate Intoxication in Ins and Children, J. Pediat. **21**:214-223 (Aug.) 1942. venson, C. S.: Oil of Wintergreen Poisoning: ort of Three Cases, One with Autopsy, and a iew of the Literature, Am. J. M. Sc. **193**:772-788 ne) 1937.

4. Hanzlik, P. J.; Scott, R. W., and Thoburn, T. W.: The Salicylates: V. Excretion of Salicyl in the Urines of Rheumatic and Non-Rheumatic Individuals, J. Pharmacol. & Exper. Therap. **9**:247-267 (Feb.) 1917.

slight tenderness to pressure over the medial malleolus of the right ankle, but no swelling or redness was visible. The results of the neurologic examination were within normal limits.

Laboratory Data.—Laboratory studies on admission to the hospital were as follows: The urine showed no protein, sugar or abnormally formed elements. Analysis of the blood showed a hemoglobin content of 8.9 Gm. per hundred cubic centimeters, a red cell count of 4,500,000 and a white cell count of 23,250, with 64 per cent adult polymorphonuclear leukocytes, 22 per cent immature forms, 11 per cent lymphocytes, 1 per cent monocytes and 3 per cent eosinophils. A test for sickling gave negative results. The erythrocyte sedimentation rate (Westergren) was 90 mm. in one hour. Wassermann and Eagle complement fixation tests gave negative results. Microscopic examination of the stool showed a few red cells, but no other abnormalities. A spinal tap revealed normal fluid under normal pressure. The patient's serum did not agglutinate typhoid A or H, paratyphoid A or B, Proteus OX 19 or Brucella abortus antigens in any dilution. The streptococcus antifibrinolysin test gave a 1 plus reaction.

Therapy and Clinical Course.—The patient's temperature fluctuated between 101 and 104 F. for the first eight days. It was thought that he might have typhoid, but repeated cultures of the blood and of the stool failed to reveal Bacillus typhosus. Two days after his admission, pain, swelling and tenderness appeared in both knee joints, and on the following day fluid was present in both joints. Pain in the fingers and wrists made its appearance on the following day. The pulse, which had been relatively slow in relation to the temperature, began to increase in rate, and on the patient's fourth day in the hospital the average rate was 110. An electrocardiographic tracing at this time revealed a prolongation of the PR interval to 0.26 second and showed n changes in the ST segment.

A diagnosis of acute rheumatic fever was made, oral sodium salicylate therapy, 6 Gm. per day, started. The fever did not decrease appreciably in sponse to the administration of sodium salicylate, the pain and swelling in the joints decreased rap In four days all evidence of involvement of the j had disappeared. Administration of the drug w s sto at this time, with almost immediate appearan e of in both shoulders and in the joint of the right el

Four days later administration of sodium salicyl in oral doses of 8 Gm. per day, was resumed, prompt disappearance of the symptoms in the jo On this day the heart was found by physical and flu scopic examinations to be moderately enlarged. A forty-eight hours of drug therapy at this higher l the patient began to breathe more rapidly and n

Summary of Clinical and Hematologic Observations in a Case of Acute Salicylate Poisoning (V. R. G.)

Date	Daily Medication	Bleeding Time	Clotting Time	Pro-thrombin Time	Respiratory Rate	Comment
5/26	S.S.* 6 Gm.	.....	...	.....	20-25	
5/27	S.S. 6 Gm.	.....	...	.....	20-25	
5/28	S.S. 6 Gm.	.....	...	.....	20-25	
5/29	S.S. 6 Gm.	.....	...	.....	20-25	
5/30	None	.....	...	.....	20-25	
5/31	None	.....	...	.....	20-25	
6/ 1	None	.....	...	.....	20-25	
6/ 2	S.S. 5.3 Gm.	.....	...	.....	20-25	
6/ 3	S.S. 8 Gm.	.....	...	.....	25-30	
6/ 4	S.S. 8 Gm.	.....	...	.....	36-40	Kussmaul breathing noted
6/ 5	S.S. 8 Gm.	.....	...	.....	36-44	More severe hyperpnea and vomiting
6/ 6	S.S. 8 Gm.	.....	...	.....	38-44	Severe hyperpnea, vomiting and hallucinations
6/ 7	S.S. 8 Gm.	.....	...	.....	44-46	Severe hyperpnea, vomiting and hallucinations
6/ 8	S.S. stopped; syn. vit. K 1 mg./4	5'30"	10'	2'45"	44-46	Blood carbon dioxide content 33 vol. %; urine but no ketones present; albuminuria 2+, white and casts present
6/ 9	None	2'30"	4'	75"	28-35	Hyperpnea less marked but still present
6/10	None	1'30"	2'	45"	20-25	Respirations normal
6/11-13	.....	.....	...	.....	.....	No medication given and no unusual symptoms n
6/14	A.S.A.† 0.6 Gm.	.....	...	.....	20-25	No symptoms
6/15	A.S.A. 1 Gm.	.....	...	25"	20-25	No symptoms
6/16	A.S.A. 1 Gm.	.....	...	57"	20-25	No symptoms; no blood salicyl detected
6/17	A.S.A. 1 Gm.	.....	...	.....	20-25	No symptoms
6/18	A.S.A. 1 Gm.	.....	...	.....	20-25	No symptoms
6/19	A.S.A. 1 Gm.	.....	...	17"	20-25	No symptoms; no blood salicyl detected
6/20	A.S.A. 1.6 Gm.	1'45"	2'	70"	20-25	No symptoms; no blood salicyl detected
6/21	A.S.A. 1.6 Gm.	3'	4'	1'55"	20-25	
6/22	A.S.A. 1.6 Gm.	2'30"	3'30"	1'25"	20-25	No symptoms; syn. vit. K started, 1 mg. i.m. da
6/23	A.S.A. 1.6 Gm.	1'30"	2'	45"	20-25	Blood salicyl, 57.6 micrograms per cubic centime
6/24	A.S.A. 2 Gm.	.....	...	50"	20-25	Blood salicyl, 81.6 micrograms per cubic centime
6/25-27	A.S.A. 2 Gm.					
6/28	A.S.A. 2 Gm.	.....	...	30"	20-25	No symptoms
6/29-30	A.S.A. 2 Gm.					
7/ 1	A.S.A. 2 Gm.	.....	...	40"	20-25	No symptoms
7/ 2-4	A.S.A. 2 Gm.					
7/ 5	A.S.A. 2 Gm.	.....	...	25"	.....	Blood salicyl, 86 micrograms per cubic centimete

* Sodium salicylate.
† Acetylsalicylic acid.

deeply than usual. On the following day the hyperp became more striking; it resembled Kussmaul breath except that it was slightly more rapid. On each s ceeding day the hyperpnea became more severe. Na and vomiting appeared on the third day of therapy the higher level, and disorientation and hallucinati supervened on the sixth day. At this time the h rate averaged 110 per minute, and a gallop rhythm w present. The lungs were free of rales, and there was enlargement or tenderness of the liver or edema. T venous pressure was 110 mm. of water, and the cir lation time (decholin sodium) was eighteen seconds.

On the seventh day the patient appeared gravely The hyperpnea showed no response to oxygen or change from the recumbent to the sitting posture. T patient was semicomatose and disoriented, and it w the impression of several examiners that the sympto were of central rather than of cardiac or pulmon origin. Examination of the blood showed a bleed

of five minutes and thirty seconds, a clotting time of minutes and a prothrombin time of two minutes forty-five seconds, a value more than five times normal, which connotes almost complete absence of ulating prothrombin. The carbon dioxide–combining er was 33 volumes per cent. The urinary p_H was 5. ketones were present in the urine, but the Gerhardt gave a deep purple color characteristic of salicylates. umin was present in the urine, and many white cells finely granular casts were found in it.

alicylate therapy was stopped, and synthetic vita- K (synkamin [5,4-amino-2-methyl-1-naphthol]) administered parenterally in 1 mg. doses four times ng the day. As may be seen in the table, recovery n the hypoprothrombinemia and the hyperpnea was d. In forty-eight hours the patient's respirations e normal and the sensorium clear. The bleeding, ing and prothrombin times approached normal es, and the urine became normal. The patient's sub- ent course was interesting in that relatively small s of acetylsalicylic acid produced prothrombino- a, which regressed briefly on one occasion without administration of vitamin K even though salicylate apy was maintained. Prolongation of the prothrom- time was noted on two occasions when the amount irculating salicyl was so small as to escape detection chemical test. Synthetic vitamin K in daily paren- l doses of 1 mg. only partially controlled the hypo- thrombinemia.

PROBLEMS IN SALICYLATE INTOXICATION

That salicylate intoxication can produce many the symptoms exhibited by this patient is well ognized, but there seems to be no general eement concerning the mechanism under- g the various physiologic disturbances. On basis of experiments with animals, the perpnea has been attributed by Johnson[5] a fixed acid acidosis resulting from ac- mulation of lactic acid and other fixed acids. din,[6] Barnett, Powers, Benward and Hart- n[3] and Dodd, Minot and Arena,[7] on the er hand, have demonstrated that hyperpnea y supervene when the blood and the urinary are normal or above normal, a fact which ggests primary hyperventilation. The first o studies cited expressed the view that the icyl radical directly stimulates the respiratory ter; the work of Dodd and her associates with mals led these authors to the conclusion that nges in body temperature, the sensation of t and the increase in gaseous exchange in- ed by salicylates are more important factors n central stimulation.

Hypoprothrombinemia induced by salicylates s first demonstrated by Link, Overman, Sullivan, Huebner and Scheel,[8] whose studies on dicoumarin (3,3′-methylenebis [4-hydroxycoumarin]), the active agent producing hemorrhagic sweet clover disease in animals, suggested that this compound may break down into salicylic acid in the body. These authors were able to produce prothrombinopenia by feeding salicylates to rats deficient in vitamin K, and many of the animals so treated died with hemorrhagic manifestations similar to those seen in sweet clover disease. Recent studies have shown that similar effects may occur in human beings even when there is no evidence of previous vitamin K deficiency. Meyer and Howard[9] have reported that vitamin K will protect completely against the reduction in prothrombin if it is given in conjunction with salicylates. Shapiro[10] estimated that approximately 1 mg. of synthetic vitamin K will counteract the prothrombin-reducing action of 1 Gm. of acetylsalicylic acid, even if it is given after the drop in prothrombin has occurred. Rapoport and his associates,[11] during investigations on the effects of large doses of salicylates on the electrolyte structure of the blood, noted that many rabbits intoxicated with salicylate died of pericardial hemorrhage during heart puncture. These authors then studied 15 rheumatic patients during periods of salicylate medication and found significant prolongations of the prothrombin time in 8 of them.

Many questions arise in connection with the observed side effects of the salicylates. The mechanism by which hypoprothrombinemia is produced is obscure. No quantitative observations have been made correlating the blood salicyl level with the change in prothrombin. No unanimity of opinion exists as to whether sodium salicylate induces acidosis in the human subject. Ketosis has been observed many times in cases of salicylate poisoning, but whether this condition represents a direct response to the drug or merely a starvation effect is unknown. In an attempt

5. Johnson, C. C.: The Salicylates: The Question Acidosis Following Administration of Salicylates, A. M. A. **94**:784-789 (March 15) 1930.

6. Odin, M.: Is Salicylate Poisoning an Acidosis? a med. Scandinav., 1932, supp. 50, pp. 177-186.

7. Dodd, K.; Minot, A. S., and Arena, J. M.: icylate Poisoning: An Explanation of the More ious Manifestations, Am. J. Dis. Child. **53**:1435-1446 ne) 1937.

8. Link, K. P.; Overman, R. S.; Sullivan, W. R.; Huebner, C. F., and Scheel, L. D.: Studies on the Hemorrhagic Sweet Clover Disease: XI. Hypoprothrombinemia in the Rat Induced by Salicylic Acid, J. Biol. Chem. **147**:463-474 (Feb.) 1943.

9. Meyer, O. O., and Howard, B.: Production of Hypoprothrombinemia and Hypocoagulability of the Blood with Salicylates, Proc. Soc. Exper. Biol. & Med. **53**:234-237 (June) 1943.

10. Shapiro, S.: Studies on Prothrombin: VI. The Effect of Synthetic Vitamin K on the Prothrombinopenia Induced by Salicylate in Man, J. A. M. A. **125**: 546-548 (June 24) 1944.

11. Rapoport, S.; Wing, M., and Guest, G. M.: Hypoprothrombinemia After Salicylate Administration in Man and Rabbits, Proc. Soc. Exper. Biol. & Med. **63**:40-41 (May) 1943.

to throw some light on these problems, the following studies were undertaken.

EXPERIMENTAL STUDIES

Subjects.—Six hospitalized children ranging in age from 6 to 11 years were chosen for the study. There were 4 boys and 2 girls. Five of the 6 were convalescent from orthopedic disorders and were entirely well except for their healing local lesions. The sixth (J. E.) had chorea and acute rheumatic carditis. All had eaten a general ward diet for at least ten days before the start of the experimental period. No medicines were administered for a week preceding the observations.

Procedure.—Control determinations of blood salicyl level, alkali reserve, bleeding, clotting and prothrombin times, urinary p_H and the other urinary constituents recorded in the accompanying charts were made for all subjects during the first twenty-four hour period. bath and analyzed for carbon dioxide-combining p within thirty minutes. Salicyl levels were determ later the same day. Daily urinalyses were carried promptly on the first voided specimen of the day.

The blood salicyl was determined by the metho Brodie, Udenfriend and Coburn,[12] in which the of salicylic acid in the blood is taken as the measu blood salicyl. The carbon dioxide-combining powe the blood was determined by the Van Slyke manom technic. The bleeding time was estimated by a st ardized needle prick of the left index finger. clotting time was measured on capillary blood by capillary tube method. The prothrombin time was de mined by the Quick method,[13] using desiccated r brain thromboplastin which had been stored in vac The normal prothrombin time by this method ra from twenty to twenty-eight seconds, with an ave value of twenty-five seconds. The urinary p_H was de mined with nitrazine paper. The standard Bene

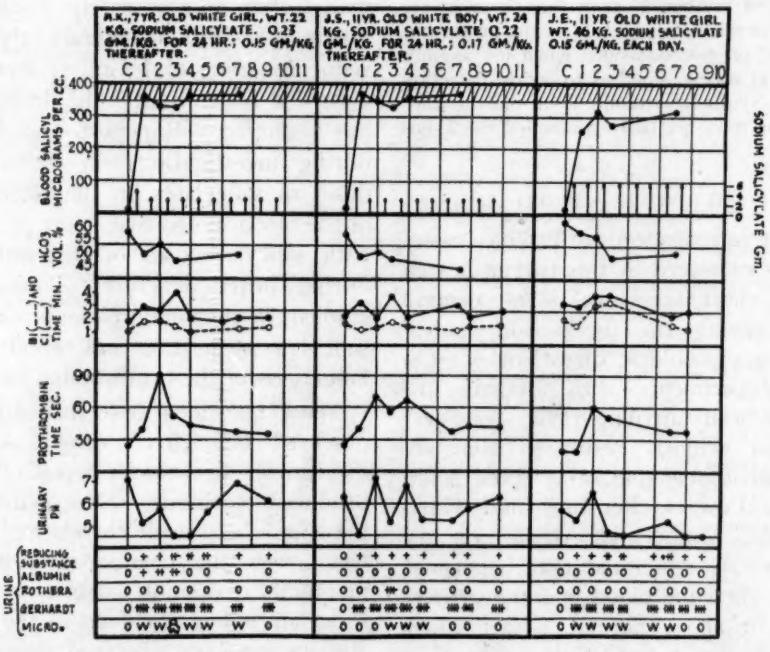
A.K., 7 YR. OLD WHITE GIRL, WT. 22 KG. SODIUM SALICYLATE. 0.23 GM./KG. FOR 24 HR.; 0.15 GM./KG. THEREAFTER.
J.S., 11 YR. OLD WHITE BOY, WT. 24 KG. SODIUM SALICYLATE 0.22 GM./KG. FOR 24 HR.; 0.17 GM./KG. THEREAFTER.
J.E., 11 YR. OLD WHITE GIRL WT. 46 KG. SODIUM SALICYLATE 0.15 GM./KG. EACH DAY.
C 1 2 3 4 5 6 7 8 9 10 11
BLOOD SALICYL MICROGRAMS PER CC.
SODIUM SALICYLATE Gm.
HCO3 VOL. %
Bl(——) AND Cl(- - -) TIME MIN.
PROTHROMBIN TIME SEC.
URINARY PH
URINE
REDUCING SUBSTANCE
ALBUMIN
ROTHERA
GERHARDT
MICRO.

Chart 1.—Effects of administering sodium salicylate to 3 patients at levels of from 0.23 Gm. to 0.15 Gm. kilogram of body weight per twenty-four hours on the blood salicyl level, alkali reserve, bleeding, clotting prothrombin time, urinary p_H and other chemical and microscopic constituents of urine. The arrows desig the total amount of sodium salicylate ingested each day. The control values are designated by *C*. The sha area in the blood salicyl column represents the "therapeutic level" deemed necessary by Coburn (see text). designations *W* and *R* in the column for microscopic examination of urine refer to white blood cells and blood cells respectively.

Sodium salicylate was subsequently administered by mouth at four hour intervals in the following amounts: (1) 0.22 Gm. per kilogram per twenty-four hours, (2) 0.15 Gm. per kilogram per twenty-four hours and (3) 0.09 Gm. per kilogram per twenty-four hours. In the 2 children who received 0.22 Gm. per kilogram nausea, vomiting and tinnitus developed after twenty-four hours of therapy, necessitating a drop to 0.17 and 0.15 Gm. per kilogram respectively; this dosage was maintained for the remainder of the experimental period. Medication was continued from four to seven days. Blood for chemical analysis was drawn under oil from the fasting subjects each morning, placed immediately in an anise qualitative test was used to detect urinary reduc substance; all other tests on urine were carried according to standard procedures.

12. Brodie, B. B.; Udenfriend, S., and Coburn, A. The Determination of Salicylic Acid in Plasma, J. Ph macol. & Exper. Therap. **80**:114-117 (Jan.) 1944.

13. Quick, A. J.: The Hemorrhagic Diseases and Physiology of Hemostasis, Springfield, Ill., Charles Thomas, Publisher, 1942.

14. The thromboplastin used in this study was s plied by the Department of Medical Research, Winth Chemical Co.

RESULTS

Charts 1 and 2 show the results obtained.

Blood Salicyl Level.—It is noteworthy that y the subjects who received 0.2 and 0.22 Gm. r kilogram for the first twenty-four hours at- ned blood salicyl levels which Coburn would nsider adequate for the treatment of rheumatic er. In both of these children toxic symptoms nnitus and vomiting) developed within twenty- r hours; so the dose was reduced to 0.15 and 7 Gm. respectively, with complete disappear- e of toxic effects. In spite of this reduction in sage, levels over 350 micrograms (of salicylic d) per cubic centimeter of blood were main- ned. The subjects who received only the er dose of the drug throughout the experi- ental period failed to attain the therapeutic vel, as did those who received still smaller nounts.

Alkali Reserve.—Five of the 6 subjects owed a moderate but significant fall in the rbon dioxide–combining power of the blood. he drop averaged 12 volumes per cent, which presents, roughly, a 20 per cent decrease in kali reserve. The effect was slightly more onounced at the higher levels of dosage, but ere was no exact correlation between the nount of salicylate administered and the mag- tude of the bicarbonate deficit. Careful obser- tions of rate and depth of respiration were ade, and none of the patients exhibited tachy- pnea or hyperpnea. There was no consistent rise in the p_H of the urine, and acetonuria was not demonstrated except in sporadic instances. In view of the lack of respiratory change and the persistence of acid urine, accumulation of fixed acid offers the most likely explanation for the fall in alkali reserve.

Clotting Mechanism.—In every instance the prothrombin time showed marked prolongation, the first change occurring within twenty-four hours of the start of administration of the drug. By the second day the hypoprothrombinemia was at its height, but thereafter there was a spontaneous drop in prothrombin time in spite of continued salicylate therapy. In no instance were the normal pretreatment levels reached, but the improvement was striking in almost every case. The bleeding and the clotting time were not consistently altered, although there was a tendency toward slight lengthening of both at the height of the prothrombinopenia.

Urinary Changes.—The p_H of the urine was not significantly altered. All subjects excreted small amounts of reducing substance while receiving salicylate. This material was not fermented by a suspension of washed yeast. Urines containing it gave a strongly positive reaction to the Tollens naphthoresorcinol test; this indicates that glucuronides were probably responsible for the reducing action. Albuminuria was noted on 3 occasions in 1 patient and on 1 occasion in

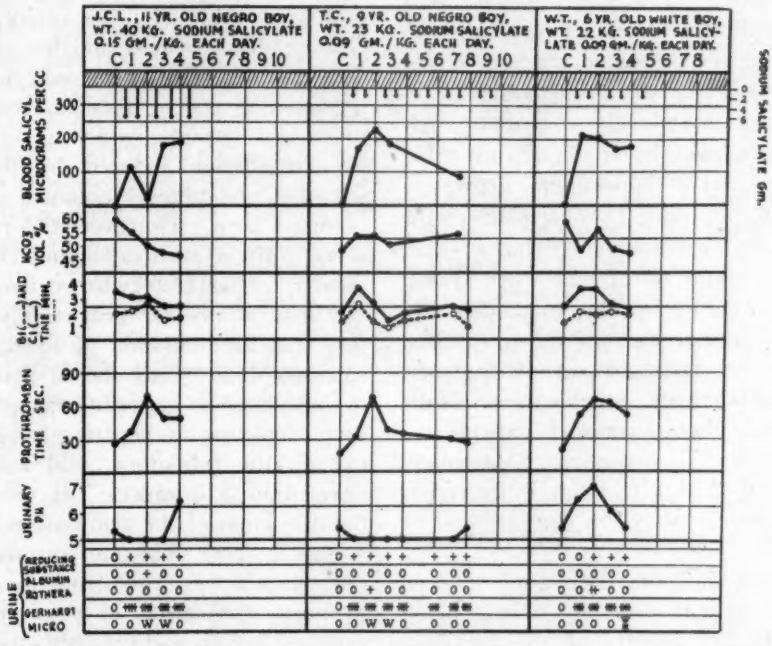

Chart 2.—Effects of administering sodium salicylate to 3 patients at levels of from 0.15 Gm. to 0.09 Gm. per ogram of body weight per twenty-four hours. See legend under chart 1.

another. White blood cells appeared frequently in the urine, and red cells were seen in 2 instances. Acetone as determined by the Rothera test was noted only 3 times in 38 specimens and disappeared without the employment of special measures. The markedly positive reaction to the Gerhardt test denoted the presence of a salicylate condensation product and could be distinguished readily from a true positive reaction for acetoacetic acid by the purple color, which persisted after preliminary boiling of the urine.

COMMENT

There have been several reports of hemorrhagic complications attending the administration of salicylates, and it is likely that hypoprothrombinemia constitutes one of the mechanisms by which this effect is induced. As Link has pointed out, prothrombin deficiency alone cannot be responsible for the hemorrhages. Other factors, such as vascular dilatation, vascular injury and trauma, undoubtedly contribute their effects. Nevertheless, it is significant that hemorrhages regularly appear in artificially induced salicylate poisoning in rats, hemorrhagic disease of the newborn and hemorrhagic sweet clover disease of cattle, all of which are known to be associated with hypoprothrombinemia. In the light of knowledge concerning the generalized vascular injury occurring in rheumatic fever, the danger of hemorrhagic complications resulting from salicylate therapy in such patients becomes real indeed. Ashworth and McKemie [15] recently observed 2 deaths from hemorrhagic encephalitis in which salicylates appeared to be the lethal factor.

Our studies have shown no correlation between the amount of ingested salicylate or the blood salicyl level and the severity of the hypoprothrombinemia, within the limits of the dosage employed. Prothrombin deficiency was demonstrated on several occasions in the Negro boy, V. R. G., when the blood salicyl level was too low to be detected by chemical test. The explanation for the spontaneous rise in prothrombin in all of the experimental subjects after forty-eight hours is not clear. Apparently this represents a compensatory phenomenon of some sort, but it fails to achieve completely satisfactory restitution of prothrombin level. There are several possible reasons why the boy V. R. G. failed to exhibit this phenomenon. He was receiving a larger dose of sodium salicylate than the experimental subjects. His appetite was poor and his food intake small, and it is qui possible that he was deficient in vitamin before salicylate was administered. Klinge has presented evidence for the view that hepa damage occurs in acute rheumatic episodes ev without cardiac failure, and it is conceivab that hepatic dysfunction might occur on th basis, with depression of the prothrombi forming activity. Such dysfunction, if prese cannot have been severe, since the patient prothrombin level promptly rose to normal wi intensive vitamin K therapy.

The consistent lowering of the alkali reser which occurred when the sodium salt of salicyl acid was administered in nontoxic amounts experimental subjects was a rather unexpecte finding, in view of the lack of ketosis or of re spiratory change. There is no evidence tha sodium is excreted more rapidly than the sal cylate radical. Guest and his associates [17] hav demonstrated that true salicylate intoxicatio produces a type of alkalosis based on a defic in carbon dioxide, which is secondary to th hyperventilation induced by the drug. Thi situation undoubtedly obtained in the first cas reported here. However, the fall in alkali re serve in the experimental subjects was unaccom panied by respiratory or urinary changes an can be accounted for most readily by the assump tion that accumulation of fixed acids occurre Lutwak-Mann [18] has shown that administratio of salicylates to experimental animals results i early depletion of hepatic glycogen, which ma explain the transitory mild ketosis which de veloped in 3 instances. It would appear tha the distortion of the acid-base equilibrium whic occurs in acute salicylate poisoning is a comple phenomenon resulting from many factors, viz primary stimulation of respiration, fixed aci acidosis, ketosis and possibly other changes. Th extreme hyperpnea exhibited by V. R. G. wa unassociated with ketosis, and without knowin the p_H of the blood, it is impossible to decid whether the low blood bicarbonate was the re sult of hyperventilation, accumulation of fixe acids or both. It was the impression of all wh saw this boy that the intense hyperpnea wa out of all proportion to the deficit of carbo dioxide and was almost certainly of centra

15. Ashworth, C. T., and McKemie, J. F.: Hemorrhagic Complications, with Death Probably from Salicylate Therapy, J. A. M. A. **126**:806 (Nov. 25) 1944.

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18. Lutwak-Mann, C.: The Effect of Salicylate an Cinchophen on Enzyme and Metabolic Processes, Bio chem. J. **36**:706-728 (Dec.) 1942.

rigin. Although we have no data bearing rectly on the mechanism of the respiratory sturbance, it seems to us unlikely that changes temperature and in sensations of heat can lly explain the dramatic hyperpnea. We have served many patients whose temperatures ere artificially raised to 106 F. in the inducto-erm, and they showed no such disturbance, though loss of heat from the body is severely rtailed under these conditions.

The appearance of albuminuria and of ab-ormally formed elements in the urine suggests at salicylates have an irritating effect on the nal parenchyma.

SUMMARY AND CONCLUSIONS

In order to achieve blood salicyl levels of the rder of 350 micrograms per cubic centimeter, odium salicylate has to be administered in mounts which border on toxic doses for chil-ren. Evidence is presented which suggests at after an initial twenty-four hour period of rge doses the amount given may be reduced ithout subsequent diminution in blood salicyl vel. It is highly desirable, therefore, that the oburn treatment for rheumatic fever be con-rolled by repeated estimations of the blood alicyl level in order to attain maximum thera-eutic effectiveness with minimal doses.

Moderate as well as large doses of sodium salicylate regularly induce hypoprothrombinemia, which may regress spontaneously to some extent as treatment continues. Large doses of vitamin K appear to prevent the development of prothrombin deficiency and to hasten its restoration to normal levels when the deficiency is already present.

Doses of sodium salicylate as small as 0.09 Gm. per kilogram per twenty-four hours produce a moderate decrease in the alkali reserve not associated with ketosis or with evidence of respiratory alkalosis. This is interpreted as a fixed acid acidosis.

The severe hyperpnea of salicylate intoxication may be unassociated with ketosis and out of all proportion to the bicarbonate deficit. The hyperpnea appears to be the result of central stimulation by the salicyl radical.

When given over a period of several days, sodium salicylate may produce renal irritation and sporadic ketosis.

Sodium salicylate as well as other compounds of salicylic acid should be administered to children with due regard for the hypoprothrombinemia and the acid-base changes which they may produce without overt signs. The concomitant administration of vitamin K is indicated.

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OXYURIASIS

A CLINICAL SURVEY OF 200 CONSECUTIVE CASES OF INFECTION WITH ENTEROBIUS VERMICULARIS IN CHILDREN

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The development of the cellophane tip, introduced by workers in the National Institute of Health, has provided for the first time a practical laboratory method of diagnosing oxyuriasis.[1] By means of this technic it has been shown that the incidence of this disease is greater than was previously thought.[1] While the method has limitations, as will be demonstrated in this paper, it has proved superior as a means of diagnosis to examinations of stools and of stool concentrates. Brady and Wright used the cellophane tip in studying the symptomatology of this disease in a group of 200 outpatients in Washington, D. C.[2]

SYMPTOMS COMMONLY ASSOCIATED WITH OXYURIASIS

Textbooks list numerous symptoms attributed to infection with pinworms. The following compilation includes those commonly associated with oxyuriasis by standard texts and by available periodical literature.[3]

General symptoms: (1) Anemia; (2) malnutrition; (3) anorexia; (4) dark circles under the eyes.

Abnormalities of Blood: Eosinophilia.

Gastrointestinal symptoms: (1) Nausea a vomiting; (2) abdominal pain; (3) sensatio produced by worms migrating about the perian region, such as pruritus ani; (4) excoriation the perianal region by scratching, seconda dermatitides and infections; (5) rectal colic d to the presence of worms in the rectum; (appendicopathia.

Genitourinary symptoms: (1) Enuresis; (nocturia; (3) vaginal irritations and discharg

Nervous symptoms: (1) Restlessness night; (2) insomnia; (3) lack of cooperati and inattention at school; (4) changes in pe sonality due to a feeling of shame; (5) biti the nails, sucking the thumbs, picking the nos gritting the teeth; (6) convulsions.

Allergic symptoms: (1) Eczema (allergic (2) sneezing; (3) asthma.

The principal objects of the present commun cation are (1) to identify critically the sympton of oxyuriasis and (2) to offer for the sympton found a rational explanation based on the path logic features of this disease.

SUBJECTS IN THE PRESENT STUDY

The patients included in this study were se either in the pediatric wards or in the outpatie clinic of Gorgas Hospital, Ancon, Canal Zon from Jan. 1, 1941 to Jan. 1, 1944. Since the is in operation in the Canal Zone a system federally administered medical care for goverm ment employees and their families, no socioeco nomic selection existed in this series, and a groups were represented. Racially the patient were white, Negro, Indian, Chinese, Hindu an mixtures of these strains. Since none but th white and the Negro patients presented feature of "pure" race, for convenience the patients wer classified as white, Negro and mestizo, the la term being used loosely to designate a perso of mixed white and other blood.

From the Pediatric Department of the Medical Service, Gorgas Hospital, Ancon, Canal Zone, Col. Wilmer C. Dreibelbies commanding.

1. Cram, E. B.: Studies of Oxyuriasis: XXVIII. Summary and Conclusions, Am. J. Dis. Child. **65**:46-59 (Jan.) 1943.

2. Brady, F. J., and Wright, W. H.: XVIII. The Symptomatology of Oxyuriasis as Based on Physical Examination and Case Histories of Two Hundred Patients, Am. J. M. Sc. **198**:367-372 (Sept.) 1939.

3. (*a*) Brady.[2] (*b*) Strong, R. P.: Stitt's Diagnosis, Prevention and Treatment of Tropical Diseases, ed. 6, Philadelphia, The Blakiston Company, 1942, vol. 2, p. 1232. (*c*) Craig, C. F., and Faust, E. C.: Clinical Parasitology, ed. 3, Philadelphia, Lea & Febiger, 1943, p. 283. (*d*) Faust, E. C., in Brennemann, J.: Practice of Pediatrics, Hagerstown, Md., W. F. Prior Company, Inc., 1944, vol. 2, chap. 35, p. 8.

A total of 200 patients were studied. These re subdivided into two groups: group 1, con- ing of 100 patients from the hospital wards, group 2, consisting of 100 patients from the patient clinic.

Sex.—In group 1 there were 55 boys and girls. In group 2 there were 45 boys and girls. Thus sex distribution was equal.

Age.—Group 1 showed no particular pattern age distribution, the only feature noteworthy this connection being a low incidence of the ection in infants under 2 years of age. oup 2 showed in addition to this a high in- ence between the ages of 2 and 5 years ble 1).

TABLE 1.—*Age of Patients at Time of Diagnosis of Oxyuriasis*

ges of tients, Yr.	Number of Patients	
	Group 1	Group 2
1	7	4
2	16	14
3	12	15
4	7	19
5	7	16
6	10	4
7	6	7
8	8	6
9	13	5
10	7	4
11	1	4
12	6	2

Race.—In the pediatric service there are sepa- e wards for Negro and for white children. hite children and light-colored mestizos, who for the most part in the upper pay brackets, placed in the white ward; Negroes and rker-colored mestizos, mostly in the lower pay ckets, are placed in the Negro ward. Admis- ns to each ward are about equal. In group 1, per cent were white, 20 per cent mestizo and y 9 per cent Negro. The distribution in oup 2 was even more striking, 90 per cent ng white, 10 per cent mestizo and none gro.

Location of Dwellings.—The patients came m dwellings of various types and locations the Isthmus. In order to determine whether e and location of dwelling had a causal rela- nship to oxyuriasis, the children were divided o (1) those living in the Canal Zone, where wding is minimal, sewage disposal excellent d toilet and bathing facilities adequate; (2) se living in the City of Panamá, where poverty d overcrowding are great, sewage disposal rly good and toilet and bathing facilities inade- ate, and (3) those living in the interior of Republic of Panamá, where there is no crowd- but where living conditions are primitive. In group 1 the distribution was as follows: Canal Zone, 81 per cent; City of Panamá, 14 per cent; interior, 5 per cent. In group 2 it was: Canal Zone, 84 per cent; City of Panamá, 13 per cent; interior, 3 per cent. This observation can be correlated with the racial distribution, since most of the white children lived in the Canal Zone, while most of the mestizos and the Negroes lived either in the City of Panamá or in the interior.

SYMPTOMATOLOGY

Almost all of the patients in group 1 entered the hospital because of diseases unrelated to oxyuriasis. Therefore, it was essential that the patients be studied carefully in order to determine whether the presenting symptoms were due to parasitic infection or to unrelated disease.

TABLE 2.—*Symptoms Encountered in 200 Children Infected with Entorobius Vermicularis*

	Percentage of Patients	
	Group 1	Group 2
Local symptoms and signs:		
Worms on anal region	13	59
Pruritus ani and associated sensations	0	17
Vaginitis, nonspecific	1	1
Symptoms secondary to local discomfort:		
Wakefulness at nights	1	7
Enuresis	0	3
Burning on urination	1	0
Nocturia	0	1
Pain in groin caused by inguinal adenitis secondary to vulvovaginitis	1	0
"Nervous" symptoms probably secondary to disturbed sleep and general discomfort:		
Anorexia	6	7
Failure to gain weight	6	1
Irritability, fretfulness, restlessness	3	3
Lethargy	2	1
Grimacing, facial tics	1	1
Thumb sucking	0	1
Gritting of teeth	0	1
Headache	0	1
Gastrointestinal symptoms probably due to irritation by enterobii within the gastrointestinal tract:		
Abdominal pain	11	13
Nausea and vomiting	5	4
Diarrhea	2	1

In the analysis of group 1 a liberal attitude was maintained. Conditions which could not be explained by unrelated disease were listed as symptoms of pinworms, even though they are frequently seen in children without pinworm infection. In group 2 the problem was simpler, since oxyuriasis was often the only disease present. The symptoms found, with the percentages of patients showing them in both groups, are listed in table 2.

Five patients in group 2 had fever of undetermined cause. This incidence is no greater than is to be expected in the tropics and is probably unrelated to infection with pinworms.

Convulsions were present in 2 patients in group 1; both instances were accounted for by

meningismus occurring at the onset of acute suppurative otitis media. No patients had convulsions as a manifestation of oxyuriasis.

Seventy-five and 50 per cent of groups 1 and 2 respectively were free from subjective symptoms attributable to oxyuriasis. Thus, in 125 patients the presence of the infection was determined either by means of cellophane tips or by the mother or nurse seeing the worms.

TABLE 3.—*Hemoglobin Values in Oxyuriasis Contrasted with Values Obtained in a Series of 30 Control Patients*

Hemoglobin, per Cent	Percentage of Patients		
	Group 1	Group 2	Control Group
50	0	0	3
55	3	0	3
60	9	4	10
65	19	39	25
70	49	43	42
75	17	14	17
80	3	0	0

LABORATORY CONSIDERATIONS

Hemoglobin.—Estimations were done by the Tallqvist technic in most instances. All 100 patients in group 1 and 30 patients in group 2 had hemoglobin determinations. There was no significant difference in hemoglobin level between the children with oxyuriasis and a control group (table 3). The control group consisted of 30 children admitted to the surgical service with simple uncomplicated fractures but free from medical disease.

Erythrocyte Counts.—As with the hemoglobin levels, the erythrocyte counts of the children

TABLE 4.—*Erythrocyte Counts in Oxyuriasis Contrasted with Values Obtained in a Series of 30 Control Patients*

Erythrocyte Counts	Percentage of Patients	
	Group 1	Control Group
Less than 3,000,000	3	9
3,000,000 to 3,500,000	21	30
3,500,000 to 4,000,000	49	37
4,000,000 to 4,500,000	29	24

with oxyuriasis were not essentially different from those of the controls (table 4). Here only group 1 has been considered, since few counts were done for group 2.

Leukocyte Counts.—Leukocytes of the 100 patients of group 1 only were considered. All deviations from the normal were caused by the unrelated presenting disease; the count varied from 3,500 to 18,500. Only four counts were above 12,000, and these were explicable infections other than oxyuriasis. The mean was between 6,500 and 7,000.

Differential Leukocyte Counts.—The percentage of neutrophils varied between 20 and with an average of 59.3. The percentage lymphocytes and monocytes combined varied tween 10 and 80, with an average of 39.3.

Special consideration was given to the eosinophils, since they have been mentioned as diagnostic in oxyuriasis (table 5). Todd and Sanford [4] stated that the normal number of eosinophils varies from 1 to 4 per cent. By standard, 7 patients in group 1 showed eosinophilia. Two of these had asthma; thus 5, 5 per cent, had eosinophilia presumably due oxyuriasis. In group 2, eosinophilia was present in 13 patients [4a] of a total of 34. One of the patients was asthmatic; hence 12 patients, 35 per cent, had eosinophilia presumably due to oxyuriasis.

TABLE 5.—*Occurrence of Eosinophilia in Oxyuriasis*

Eosinophils, %	Percentage of Patients	
	Group 1 (100 Patients)	Group 2 (34 Patients)
None	54	35
1	14	3
2	11	14
3	12	9
4	2	6
5	3	9
6	2*	9†
7	1	9
8	0	3
18	1*	0

* Includes 1 patient with asthma (1%).
† Includes 1 patient with asthma (3%).

Methods of Diagnosis.—In 13 per cent group 1 the diagnosis was made by seeing worms on the perianal region. Although examinations were done on the stools of all patients in this group, in only 1 case was diagnosis made by finding ova in the stool. Cellophane tips yielded positive results in 95 and negative in 5 per cent of the cases. Worms were seen in 59 patients of group 2. For 19 of the 59 tips were done with 13 positive and 6 negative results. For the remaining 40 patients the diagnosis was made by tips alone, without worms being seen. Two examinations of stools were done for the patients of group 2, and all gave negative results.

4. Todd, J. C., and Sanford, A. H.: Clinical Diagnosis by Laboratory Methods, ed. 10, Philadelphia, W. B. Saunders Company, 1943, p. 278.

4a. ED. NOTE.—The percentages in the column for group 2 in table 5 seem to account for only 33 (instead of 34) patients and to show only 12 with eosinophilia. Because the authors are in military service, we were unable to send them a proof and get this discrepancy explained or corrected.

TREATMENT

In general, three types of treatment were tried e: 1. Administration of gentian violet in eric-coated capsules. This was given in doses from 0.25 grain (0.015 Gm.) to 1 grain 06 Gm.) three times a day twenty minutes ore each meal for two periods of eight days h, interrupted by a rest period of seven days. is treatment was used only for children old ugh to swallow the capsules intact. 2. Administration of quassia enemas. Rectal injections 2 to 3 ounces (60 to 90 cc.) of a strong infun of quassia chips were given, followed in enty minutes by a soapsuds enema. This tine was repeated on alternate days for two nths. 3. Administration of tetrachloroethyl-. This medicine was given in a single dose ceded the night before by a preparatory purga- of magnesium citrate. Treatment was adnistered at 8 a. m. with another dose of gnesium citrate and food withheld until per.

Irrespective of the type of therapy, all mothers patients were given specific instructions reding prevention of self reinfection in their ldren. The finger nails were ordered cut d ammoniated mercury ointment applied to fingers and the anal region twice daily. Only tetrachloroethylene was administered in the spital and in the outpatient clinic. Gentian let and quassia enemas generally were given home by the parents.

RESULTS OF TREATMENT

Evaluation of treatment is difficult because of dequate follow-up care. Furthermore, there no perfectly reliable method of ruling out yuriasis. In some patients as many as five six negative cellophane tips were followed a positive tip, and such occurrences introced the question of reinfection. The wide disbution of the ova, as demonstrated by Faust [3d] kes reinfection from outside sources a posility. Criteria used here for determining the cess of treatment were: (1) absence of visible rms on the perianal region, (2) cessation of mptoms and (3) where possible repeated negae results with cellophane tips.

Thirty-six patients of group 1 were treated h gentian violet, vomiting occurring in 2 inces. Tetrachloroethylene was given to 9 pants. Anorexia, vomiting, listlessness and rrhea occurred in 1 patient each. Thus, half the hospital patients given tetrachloroethylene wed toxic symptoms. Quassia enemas were en to 15 younger children and infants. Abdominal pain was encountered in 1 so treated. Follow-up care for group 1 was too inadequate to permit evaluation of the efficacy of the treatment.

Forty children of group 2 were treated with gentian violet, 26 with quassia enemas and 10 with tetrachloroethylene. Twenty-four received at one time or another several types of therapy, the changes being made because of failure of the first treatment tried.

Of the 40 patients of group 2 who were treated with gentian violet, 14 returned for follow-up care. Of these 14 patients 7 had originally had symptoms and 7 had been without symptoms; in 13 worms had been seen by the mother. Of the 7 patients who had had symptoms there were complete success with 6 and failure with 1, as judged by disappearance of symptoms and of visible worms together with between one and four negative results with tips. Of the 7 patients who had been without symptoms worms were seen in 6 and for 1 the diagnosis was made by means of a tip. All were successfully treated as judged by similar criteria. However, in the treatment of 5 other patients given gentian violet the use of the drug had to be discontinued because of vomiting. Furthermore, younger patients cannot be treated with this drug as outpatients, because they will not willingly swallow the capsules whole and mothers cannot be trusted to insert them into the esophagus.

Of the 26 patients treated with quassia, 10 returned for follow-up care. Of these 10, 6 were originally symptomatic and 4 were asymptomatic. All showed symptomatic relief, although in 2 there was continued infection, as indicated by the persistence of worms in 1 child and by a positive tip in the other.

Eight patients given tetrachloroethylene returned for follow-up care. Six of these were symptomatic. In none was there relief from symptoms, and all but 2 continued to have visible worms and positive results with tips and visible worms.

Although numerically too small for conclusive decisions, these series have been presented because they show results of therapy under typical office conditions.

COMMENT

Racial Distribution.—Several points in this analysis merit comment. First is the failure to find infection in the Negroes and mestizos in the proportion which would be expected in the face of low standards of cleanliness. Cram also reported a much higher incidence of oxyuriasis in white persons than in Negroes in Washing-

ton.[1] To date no satisfactory explanation of this seemingly paradoxic observation has been advanced.

Age Distribution.—As regards the age of patients, the relatively even distribution in group 1 seems to indicate that after 2 years of age the infection rate is fairly even, with probably a gradual fall as adult life is approached. The high incidence between 2 and 5 years of age in group 2 may be due to the facts that mothers still observe their children closely at these ages and that such symptoms as pruritus ani are more obvious in the uninhibited child.

Symptoms.—In a critical review of the symptoms seen in these cases, it seems that such local disturbances as pruritus ani, vaginal irritations and local secondary infections can be attributed definitely to oxyuriasis. A second group of symptoms, consisting of wakefulness at night, pain on urination, nocturia and possibly enuresis, can be attributed to the discomfort of vaginitis and pruritus ani. The "nervous" symptoms should be considered in a third group: Anorexia with consequent failure to gain weight, irritability, lethargy, nail biting, thumb sucking, gritting of teeth, headache, tics, etc., while frequently seen in uninfected children, are all aggravated by disturbance of sleep and by general discomfort. Thus they may be symptoms of oxyuriasis when seen in an infected child. This psychogenic explanation seems more rational than that of Craig and Faust [3c] and of Strong,[3b] who considered these manifestations reflex reactions to exposure of sympathetic nerve endings by erosion of the cecal mucosa. These writers also mentioned convulsions as a symptom. Not a single instance was encountered in this series. Nor does the theory that convulsions can result from reflex irritation originating in an ulcerated mucosa appear tenable, because convulsions are rarely encountered in amebic dysentery and in ulcerative colitis. In the absence of irrefutable proof, pinworms should not be considered a cause of convulsions in children.

Gastrointestinal symptoms, such as abdominal pain, diarrhea, nausea and vomiting, can be explained readily as the result of irritation of the intestinal mucosa, as was demonstrated by Faust.[3d] The symptom of abdominal pain was seen in both group 1 and group 2 with considerable frequency. In most instances it was vague, and the patients did not show the picture associated with abdomens requiring surgical intervention. However, since the association of pinworms with appendicitis has been so frequently discussed, it was felt advisable to investigate separately from the general group a series patients on whom appendectomies were p formed. Thirty-five appendectomies were p formed on children in Gorgas Hospital dur the three years covered by this survey.[5] Of 35 patients who were considered clinically have appendicitis and who were therefore op ated on, 7 had pinworms in the appendix. the 7 appendixes, 5 were classified pathologica as acutely catarrhal and 1 as fibrotic; 1 show no pathologic manifestations other than the pr ence of enterobii. Of the 28 appendixes containing pinworms, 10 were suppurative, acutely catarrhal, 1 fibrosing, 1 gangrenous a 5 normal. It seems justifiable in the face this 20 per cent incidence and of the associat pathologic findings to consider that entero can and do cause catarrhal inflammation of t appendix. However, there is no evidence this series that pinworms alone can cause t suppurative form of the disease.

Whether some of the patients in this ser who complained of vague abdominal pain h enterobii on the appendix it is impossible to s In any case, the possibility that pinworm thera may obviate the necessity for appendectomy f nishes an excellent reason for searching a siduously for enterobii in patients complaini of vague abdominal pain. In the present seri this symptom frequently yielded to pinwo therapy.

There was no gross interference with t nutritional state of the patient, as was seen ascariasis, nor was there evidence of system disturbances produced by absorption of by-pr ucts or of toxins. Allergic symptoms, such asthma and eczema, did not occur with unwa ranted frequency, and when present they d not respond to worm therapy. Moderate i provement in appetite and in general well-bei probably attributable to the comfort and happ ness of undisturbed rest, was noted after tre ment.

The patients in the present study were n considered anemic. Hemoglobin levels and ery rocyte counts both in the children infected w enterobii and in the controls seem low to o unfamiliar with tropical pediatrics. Low fi ings are, however, commonplace in well Pan manian and Canal Zone children. These childr not only look and act normal but resist attemp to raise the hemoglobin by administration of ir or other hematinics. A slight eosinophilia w apparently present in some of the patients, b

5. Dr. H. K. Tuttle, Chief of the Surgical Servi and Col. L. B. Bates, Chief of Laboratories, gave permission to use this material.

s too inconstant and slight to be of diagnostic lue.

A suggested revision of the symptomatology oxyuriasis, based on the preceding observaons and on the well established findings in rrent literature, is presented:

A. Local symptoms: (1) Pruritus ani and sociated sensations; (2) vaginal and perianal itations and secondary infections, mostly due scratching.

B. Symptoms secondary to local discomfort:) Wakefulness at night; (2) genitourinary sturbances such as nocturia, burning on urinan and possibly enuresis, and any other sympms occasioned by nonspecific vaginitis.

C. "Nervous" symptoms, secondary to disrbed sleep and general discomfort: There is thing specific in this group, and any behavior personality difficulty certainly can be agavated, if not caused, by severe perianal itchg. Anorexia, irritability, lethargy, thumb suckg, tics and headaches are among these sympms but do not constitute all of the possibilities.

D. Gastrointestinal symptoms, probably due irritation by enterobii within the gastroinstinal tract: (1) Abdominal pain, including pendicopathia; (2) nausea and vomiting, and) diarrhea.

E. Pathologic changes in the blood: Eosinoilia.

Until further proof is presented, it would seem visable to drop from the symptomatology of yuriasis anemia, malnutrition of any marked degree, convulsions and all allergic manifestations. When such symptoms are present, the mere finding of pinworms does not explain them adequately.

Diagnosis.—There is to date no perfectly satisfactory method for the diagnosis of pinworm infection. The introduction of the cellophane tip is a great advance. However, careful observation of the anal region of the patient by the mother or a nurse, especially at night, remains an important diagnostic method. By this means, it is possible to diagnose infection at times when cellophane tips fail to reveal it. Examination of stools and of stool concentrates is of little value. The scotch tape method described by Von Hope [6] is under trial in this hospital at present.

Treatment.—Treatment was not entirely satisfactory. Gentian violet appeared to be the best of the methods tried here. However, it can be used only with older children, who, after all, do not constitute a majority of the patients with symptoms. Occasionally, even older children cannot tolerate the drug because of vomiting. Quassia enemas proved valuable, especially for infants and younger children. This method was troublesome for the mothers, and while it relieved symptoms, it did not always cure the infection. Tetrachloroethylene as used in this clinic was of no value.

6. Von Hope, F. H.: An Improved Method of Demonstrating Ova of E. Vermicularis, J. A. M. A. **125**:27 (May 6) 1944.

GENERALIZED CUTANEOUS MONILIAL INFECTION

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It is the purpose of this paper to report an instance of generalized cutaneous monilial infection in a young child. Survey of the literature shows comparatively few instances of this infection, the largest series being that of F. W. Schlutz,[1] who studied 5 instances of generalized systemic thrush during twenty-five years of pediatric practice. Schlutz roughly classified generalized thrush into two types. The first the chronic septic form, with lesions of the buc mucous membrane and extensive angina. It volves the gastrointestinal tract, including anus, and the female genitalia. Often there more or less involvement of the lungs; the li and the kidneys are the abdominal organs m often affected. The second type consists of t exceedingly chronic forms, with cutaneous lesio affecting the extremities, the nails, the nail b and, in isolated patches, the trunk. In this ty of thrush the cutaneous lesions are dry, sca

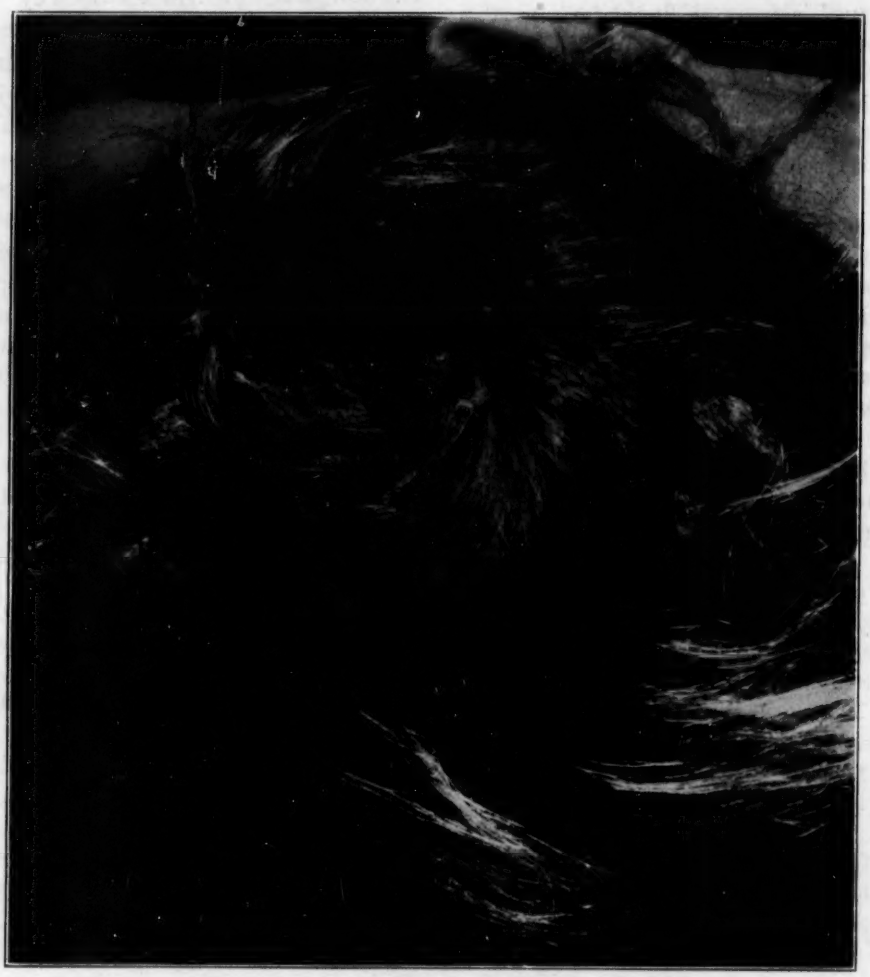

Fig. 1.—Scalp of a 2 year old girl with monilial infection.

From the Skin Clinic, The Skin and Cancer Hospital of Philadelphia.

1. Schlutz, F. W.: Systemic Thrush in Childhood, J. A. M. A. **105**:650 (Aug. 31) 1935.

d crusted and characterized by only slight hing except when the interdigital spaces are volved. At no time is the inflammatory reac- n of the skin severe. Vesicles are observed. l the 5 instances of generalized moniliasis ob- rved by Schlutz were of the chronic septic type. he interesting features of these cases are a arfing effect in 2 patients and alopecia in 3. psis, when it occurred, was rapid and gen- alized, and treatment proved futile.

testinal involvement with recovery. Pels and his associates [4] described an interesting case of monilial infection in a boy, with involvement of the face, scalp, ears, neck, upper part of the chest, thumb and mouth, which lasted many years, proved resistant to treatment and was finally fatal. Downing and Hazard [5] reported an instance of cutaneous moniliasis with oral thrush in a white boy 15 years of age. For eighteen months there was a horny eruption on the face.

Fig. 2.—Arms and hands of a 2 year old girl with monilial infection.

J. F. Schamberg [2] reported an instance of rush of the mouth in a 6 month old infant, with tensive cutaneous lesions and death. M. Gold- g [3] reported an instance of thrush complicated acute polyarthritis and extensive gastroin-

Eight years prior to this he had suffered from canker sores, and two years before a nail had become painful. On his admission to the hospital there were lesions on the cheeks and the lips and a blackish yellow lesion on the nose. There was little inflammation, and after the lesions healed

2. Schamberg, J. F.: Report of Case of Extensive tal Thrush with Involvement of the Skin and condary Infection of the Mother's Breasts, Arch. diat. **32**:617, 1915.

3. Goldring, M.: Thrush Complicated by Acute lyarthritis in an Infant, J. A. M. A. **76**:724 (March 1921.

4. Pels, I. R.; Dresel, I., and Salinger, R.: An Unusual Eruption Due to an Organism of the Monilia Group, Arch. Dermat. & Syph. **14**:280 (Sept.) 1926.

5. Downing, J. G., and Hazard, J. B.: Cutaneous Moniliasis Associated with Oral Thrush, Arch. Dermat. & Syph. **31**:636 (May) 1935.

pitted scars remained. The patient ultimately died of tuberculous pneumonia.

REPORT OF A CASE

N. C., a white girl aged 2 years, was brought to the clinic with the history that in the past summer, for the second time, the child had broken out with a rash. Examination of the skin showed marked matting of the hair of the scalp. The crusts were yellowish, and the hair grossly showed no abnormality. There were no breaking off of the hair, no hair stumps, no scaling and no patches of alopecia. The picture of the scalp simulated that in neglected pediculosis capitis with secondary pyoderma, except that here marked impetigination was absent. The forehead, arms, hands and thighs presented a uniform picture of circinate lesions with clear or scarcely scaly centers and crusted, elevated, scaly borders. Here and there appeared evidence of a vesicular element at the border. Inflammation was noticeably absent, and there was only moderate subjective discomfort. The nails of the hands and feet were involved and presented loss of transparency, a dark yellowish brown color, thickness and fragility. A mild degree of paronychia was present. The picture presented was quite at variance with the chronic monilial onychia seen in adults. The buccal mucous membranes were normal, and evidence of perlèche and of erosio interdigitalis blastomycetica was absent. There was no vaginal or anal involvement.

Physical examination showed an otherwise normal child, in good health, well nourished and with no gastrointestinal symptoms. The parents were healthy. The mother did not complain of leukorrhea.

Laboratory Studies.—Direct examination of the crusts of the scalp, of the finger nails and of the cutaneous lesions showed numerous mycelial threads and gro of spores. The myceliums showed little branchi Material from the various affected areas was inocula on Sabouraud's medium. It was studied by Dr. Ran C. Rosenberger, who submitted the following repo "The cultures from the skin, nails and eyebrows sh a whitish, smooth, glistening growth, and spreads m from each of these growths show oval, spheroid a elongated budding cells. In my opinion the organi corresponds morphologically and culturally with Moni albicans." Inoculation of gelatin with material from cutaneous lesions and the scalp produced liquefaction the medium, while in dextrose bouillon formation of was demonstrated. Dr. George M. Lewis studied culture and confirmed the opinion that the organism Monilia albicans.

No organisms could be demonstrated in the urine, the blood count was normal. The Wassermann Kahn reactions were negative.

Treatment.—After application of 50 per cent alco all of the cutaneous eruptions disappeared, but t recurred later. An iodine ointment prescribed for scalp was also used on the cutaneous relapsing lesio it proved beneficial.

SUMMARY

The exceedingly chronic form of generali moniliasis occurred in a young child. T cutaneous lesions were arcuate in form with l insignificant inflammatory reaction, and caus only slight subjective discomfort.

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PRIMARY TUBERCULOSIS

EFFECT OF UNRESTRICTED ACTIVITY ON PROGNOSIS

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NEW YORK

Although the pathologic changes characteristic of the primary complex of tuberculosis are fairly well understood at the present time, the indications for treatment and the methods of treatment are still subjects of controversy.

Until recent years all children who showed positive reactions to the tuberculin test, even in the absence of signs or symptoms of tuberculosis activity, were given special attention. Increased rest was advised, school classes in the open air were instituted and preventoriums were established throughout the United States. Within the past few years preventoriums and treatment in the open air for children who react positively to the tuberculin test have for the most part been discontinued, for it is now generally accepted that a positive reaction to tuberculin is by itself no indication for added care except that occasional roentgenograms should be made. It has also been recognized that a child with only a positive reaction to tuberculin is no menace to other children.

On the other hand, the treatment of a patient with tuberculous infiltration of the parenchyma of the lungs during the active phase of the primary complex as evidenced by roentgenograms is still subject to dispute. Many physicians continue to advise rest in bed during the infiltrative phase of the primary complex in the hope that recovery will be hastened and complications avoided. Other physicians feel that the course of a primary tuberculous infection and its subsequent outcome are not modified by treatment.

Wallgren [1] expressed the opinion that "the child should generally be kept in bed until the sedimentation rate returns to normal. . . . On the average the necessary period of rest in bed is from four to six weeks after the fever has subsided. The child should then be allowed up for short intervals, the duration of the intervals being determined by the temperature and the results of the sedimentation tests." Wallgren further wrote: "It is generally advisable in the case of children who have not reached school age to insist on two or three hours' rest every day during the first year and one hour daily during the second year after the onset of the primary tuberculosis in addition to the midday rest which every baby should obtain. . . . In addition to the rest in bed during the acute stage of primary tuberculosis, the treatment requires an open air cure as similar as possible to that of the sanatorium routine."

Myers,[2] on the other hand, stated that "it makes no difference whether children who have the first infection type of tuberculosis are given strict rest in bed in a sanatorium and even have collapse therapy instituted, whether they are placed in a special school or whether they remain at home under the same conditions as normal children should have. The course of the disease is the same." Myers would treat the child during the febrile stage "just as when fever is caused by other infections such as influenza." He minimizes the importance of the sedimentation rate.

In view of these diverse opinions, it was felt that a study of a fairly large group of children, observed during the parenchymal involvement of a primary complex and followed for a period of years, would prove of value.

EXPERIMENTAL MATERIALS AND METHODS

The data were accumulated during the course of an investigation on tuberculosis in childhood. The study was carried on from 1926 to 1942 in the city of New York by the Bureau of Laboratories of the Department of Health. More than 1,000 children from tuberculous homes were followed during and after the first year of life. A large number of these children were brought regularly to the clinics for roentgenograms and tuberculin tests. All children were referred from tuberculosis clinics and hospitals in the city of New York.

The basis for acceptance of lesions as demonstrating parenchymal infiltration by tuberculosis was serial roentgenograms which revealed calcification on resolu-

Aided by a grant from Mead Johnson and Company.

From the New York Hospital; the Department of Pediatrics, Cornell University Medical College, and the Bureau of Laboratories, New York City Department of Health.

1. Wallgren, A.: Pulmonary Tuberculosis in Children, New York, Thos. Nelson & Sons, 1939, pp. 177 and 142.

2. Myers, J. A.: Tuberculosis in Children and Youth, Springfield, Ill., Charles C Thomas, Publisher, 1938, p. 169.

tion in a child who reacted positively to the tuberculin test.[3] The routine dose of tuberculin for intradermal tests was 0.1 mg. The reactions were read by pediatricians on the staff or by specially trained nurses.

During the course of the study gross parenchymal lesions of tuberculosis developed in 90 children. Fifty-eight were under 1 year of age when parenchymal involvement was first seen. The onset of the primary complex in 27 of these 58 infants was in early infancy. This group was listed as nonambulatory during the primary involvement, since death occurred or the evolution of the primary complex was complete or almost complete before the infants reached 12 months of age. All of the remaining 63 patients, with the exception of 3, were ambulatory during the course of the primary complex. No effort was made to restrict their activities unless the fever rose to over 101 F. by rectum. All the children were followed for at least five years from the time the pulmonary parenchymal involvement of the primary tuberculous complex was first visualized.

This paper reports the mortality and morbidity due to tuberculosis in terms of the complications as evidenced by roentgenograms, of children with gross pulmonary infiltration, who were permitted to remain ambulatory throughout the course of the primary complex.

culous, and the patient later died of the infection. These 3 children were hospitalized because of difficult situations in the home.

TABLE 1.—*Deaths and Complications in Patients with Gross Parenchymal Involvement of Lungs with Reference to Age at Which First Infection Was Acquired*

	Number	Deaths from Tuberculosis	Complications
Up to 12 months of age.. (nonambulatory)	27	16	1 (tuberculosis of hip)
Over 12 months of age... (ambulatory)	60	4	2 (1, tuberculosis of cervical and mesenteric nodes and tuberculous dactylitis; 1, tuberculosis of cervical nodes)
(Hospitalized).....	3	1	1 (tuberculosis of spine)

In view of the opinion that young infants are less resistant to the tubercle bacillus than are

Fig. 1.—Hospitalized patient (C. R.) with complication. *A*, age 13 months; infiltration in right midlung field. *B*, age 23 months: kyphosis at junction of thoracic and lumbar vertebrae. *C*, age 23 months: large psoas abscess.

RESULTS

Of the 90 children followed in this study, 27 acquired their first tuberculosis infection and went through the most active phase of the primary complex, as evidenced by roentgenograms, before they had reached their first birthday. In this group of 27 nonambulatory infants, 16 deaths and 1 subsequent complication (tuberculous disease of the hip) occurred.

On the other hand, of the 60 children who were definitely ambulatory during the period of primary parenchymal involvement 4 died from tuberculosis and only 2 had minor complications. Only 3 of the children over 1 year of age were hospitalized when the pulmonary infiltration was visualized; the spine of 1 of these became tuber-

TABLE 2.—*Deaths and Complications in Patients with Tuberculosis with Reference to Month at Which Parenchymal Involvement of the Lungs Was First Detected*

Age Parenchymal Lesion First Seen, Months	Number of Cases	Deaths from Tuberculosis	Complications
1	0	0	
2	1	1	
3	3	3	
4	5	2	Tuberculosis of knee in 1 patient
5	3	0	Tuberculosis of cervical nodes in 1 patient
6	5	2	
7	10	2	
8	5	2	
9	5	1	
10	6	2	
11	7	3	
12	8	2	
Indefinite (under 12 mo.)	1	0	
Over 12 mo.	31	1*	

* The child went through the primary complex without complication; a tuberculous reinfection occurred at 7 years.

3. The roentgenograms were read by Dr. John Carty, Professor of Roentgenology, Cornell University Medical College.

lder infants, the cases were studied with ref-rence to the month at which parenchymal in-olvement of the lungs was first detected. The esults of this study are presented in table 2.

Of the 59 patients in whom pulmonary infil-ration was first visualized during the first welve months of life, 20 died from tuberculosis, mortality of 33.9 per cent. Of the 31 patients n whom infiltration was first seen after they

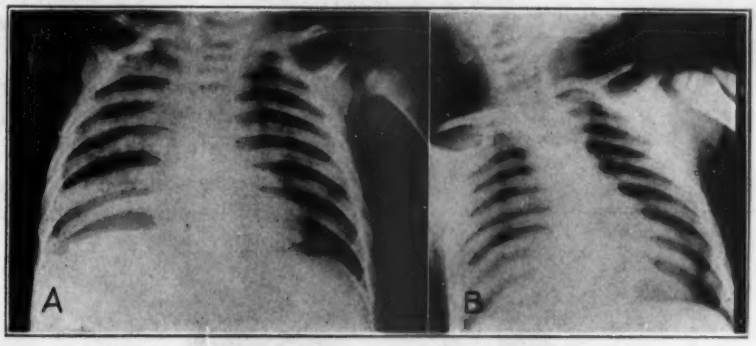

Fig. 2.—Ambulatory patient (J. Z.) with complication. *A*, age 12 months: marked consolidation in lower be of right lung; mediastinum widened. *B*, age 23 months; definite calcification of cervical nodes.

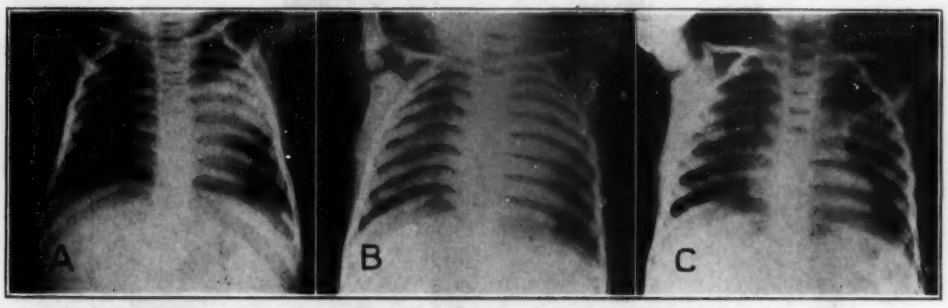

Fig. 3.—Ambulatory patient (M. F.) without complications. *A*, age 10 months: massive infiltration in upper be of left lung. *B*, age 14 months: massive infiltration in upper lobe of left lung still present. *C*, age 38 onths: large calcification of left hilus and large calcified left hilar node.

ere 12 months of age, only 1 died. Death in is instance occurred from a reinfection in a ild of 7 years who had successfully passed rough the primary complex three years before ath.

COMMENT

In spite of the fact that 60 young children ith roentgenographic evidence of primary pul-onary tuberculous infiltration were permitted be ambulatory during the acute phase of the imary complex, there was no evidence that is circumstance was in any way detrimental. ot only was there comparatively little mortality om tuberculosis, but there was no indication at the course of the disease was lengthened or at complications resulted.

In this group of 60 infants and young chil-en, a careful study of roentgenograms revealed at the average time from parenchymal infil-ation to earliest signs of calcification of the primary focus was seven and seven-tenths months and that the time to complete calcifica-tion averaged twenty-one and one-tenth months. Wallgren, who advised rest in bed for children with active primary tuberculosis, states [1] that "the first trace of calcification is generally seen after about a year or a year and a half, and after the lapse of from two to three years the primary complex has, as a rule, become com-pletely calcified." If it is assumed that the virulence of the tubercle bacilli in Sweden is similar to the virulence of those responsible for most of the morbidity in the city of New York and that the general course of infection is similar in the two places, it would appear that there was no lengthening of the period of active infec-tion in patients ambulatory during the primary complex.

An analysis of the histories of the children in this series demonstrates that the age of the children at the time of infection rather than the method of treatment is the important factor in mortality from primary tuberculosis in early childhood. The high mortality during the first year has been reported by numerous investi-gators, and the opinion has been expressed that the high degree of susceptibility at this age is in all probability due to the intimate contact of infants with parents at that time as well as to

the inability of young infants to form adequate antibodies.

In the study of patients reported on in this paper there is added evidence of the importance of intimate contact. Of the 59 infants in whom parenchymal pulmonary lesions developed before they had reached 12 months of age, 19 were exposed to their mothers and 28 to their fathers. But, as is seen from table 3, 52.6 per cent of those exposed to mothers died of tuberculosis as against 21.4 per cent of those exposed to fathers.

TABLE 3.—*Contacts and Mortality Due to Tuberculosis of Infants in Whom Pulmonary Tuberculosis Infiltration Developed Before 12 Months of Age*

Exposed to	Total	Deaths from Tuberculosis	Mortality Due to Tuberculosis, per Cent
Mother	19	10	52.6
Father	28	6	21.4

It is apparent, then, that infants exposed to mothers with active tuberculosis are much more prone to die of the disease than are those exposed to fathers. This is probably due in large part to the extremely close contact of infants with their mothers.

My results, based on the careful observation of 90 children exposed to and infected with the human tubercle bacillus, would seem to indicate that rest in bed does not in any demonstrable way alter the course of the primary comple A comparison with the studies reported Wallgren furnished no evidence that rest in b decreases the activity of the process, preve tuberculous complications or lowers the mortal from tuberculosis.

SUMMARY

The indications for treatment and the meth of treatment of the primary complex of tub culosis are still subjects of considerable cont versy.

In the course of a study on tuberculosis childhood, 90 infants were observed befo during and after their primary complex.

Twenty-seven of these infants had the prim pulmonary lesion with perifocal infiltration a

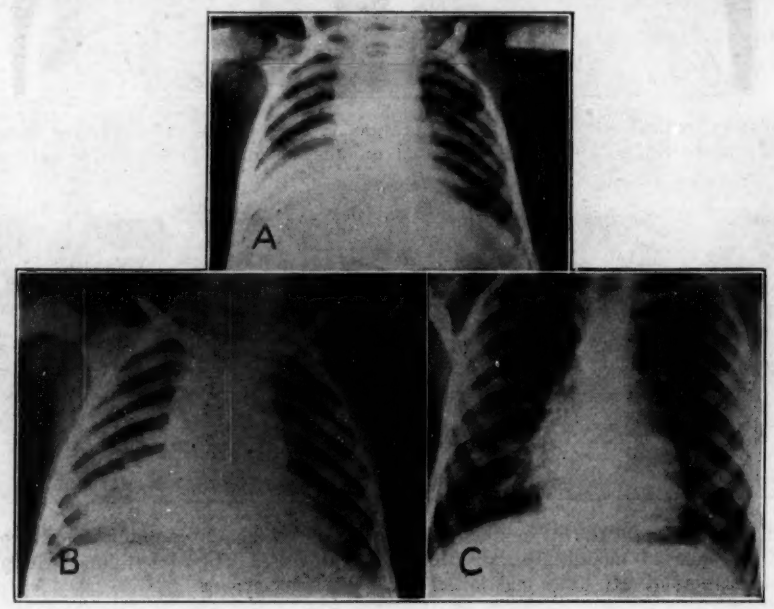

Fig. 4.—Ambulatory patient (S. K.) without complications. *A*, age 12 months: massive consolidation lower lobe of right lung; mediastinum widened. *B*, age 22½ months: consolidation still massive but resolvi mediastinum still widened. *C*, age 8½ years: dense calcification in lower lobe of right lung of cardiac bor calcified right hilar node.

went through the active phase of the prim complex before they were 12 months of a These infants were classified as nonambulat Of the 27 infants 16 died from tuberculosis 1 had a complication, tuberculosis of the hip.

All except 3 of the 63 remaining infants w ambulatory throughout the primary complex spite of the size of the pulmonary infiltrati Of these 60 ambulatory patients only 4 d from tuberculosis and only 2 had complication tuberculosis of the cervical nodes in 1 insta and multiple hematogenous lesions in the oth

Of the 3 hospitalized patients 1 died fr tuberculosis and 1 had a complication—tuber losis of the spine.

There was no evidence that rest in bed influced in any way the course of the primary mplex or reduced the incidence of complicaons and no evidence that lack of rest in bed s in any way detrimental.

It would appear that the age of the child at e time of infection rather than the method of eatment was the important factor in deterning prognosis.

In the cases reported, it was apparent that ntact with a tuberculous mother during the first year was much more dangerous than contact with a tuberculous father. This fact is probably the direct result of the intimate contact of infants with their mothers.

In my opinion, rest in bed during a primary infection with tuberculosis should be limited only to the period of elevation of temperature, as would be advised in the treatment of any febrile condition during childhood.

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ILLNESS HISTORY AND PHYSICAL GROWTH

II. A COMPARATIVE STUDY OF THE RATE OF GROWTH OF PRESCHOOL CHILDREN OF FIVE HEALTH CLASSES

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It has become a commonplace generalization among physicians, public health workers and others that the growth of children is retarded by pathologic conditions.[1] Some consider that retardation of growth is most marked as a result of severity of illness,[2] while others believe it to be most marked as a result of mild illnesses of long duration.[3]

Recourse to published studies shows that such generalizations are neither consistently nor extensively supported by experimental findings. Bowditch,[4] using 1 girl as his subject, reported 3 instances in which a small loss in weight was a precursor of disease. Woodbury,[5] using 57,977 children under 6 years of age, found stature and weight to be below average for those (203) with "rachitis" but not below average for those with a cardiac abnormality, diseased tonsils or adenoids. Turner, Lougee, Sarabia and Fuller,[6] using some 120 school children, found that the children showing the poorest annual gains in weight were as a group "distinctly inferior in respect to health behavior, amount of illness and number of physical defects when compared with the children who made the best growth." Palmer,[7] employing 4,000 elementary school children of Hagerstown, Md., found no association between stature and weight on the one hand and absence from school for illness on the other. Hardy,[8] from study of 600 children in attendance at the public schools of Joliet, Ill., did not find any relationship between number of illnesses in infancy and in childhood and stature at 20 years of age. Martens and Meredith,[9] using 88 children between 5 and 6 years of age, reported no significant differences in rate of growth from fall to spring between children practically free from illness and children frequently absent from kindergarten for illness. Sontag and Lipford,[10] using a group of 84 children, reported no association between aberrations in ossification of skeletal epiphyses and "acute or subacute" conditions of illness.

STATEMENT OF PROBLEM

None of the studies previously cited, with the exception of that of Woodbury,[5] made any attempt to discover whether certain specific diseases or classes of disease are more closely associated with growth than others. From the clinical standpoint this is an important aspect of the general problem, and it is the aspect to which the present study is intended to contribute. Specifically, the aim of this paper is to add to the available information on the relation between history of illness and physical growth a study

This is the second of a series of studies on "Illness History and Physical Growth" made under the direction of Howard V. Meredith, Ph.D., Iowa Child Welfare Research Station, University of Iowa. The earlier study appeared in the American Journal of Diseases of Children (**64**:618-630, 1942).

1. (*a*) Holt, L. E., and Howland, J.: Diseases of Infancy and Childhood, ed. 9, New York, D. Appleton and Company, 1926, p. 11. (*b*) Jeans, P. C., and Stearns, G.: The Effect of Vitamin D on Linear Growth in Infancy: II. The Effect of Intakes Above 1,800 U. S. P. Units Daily, J. Pediat. **13**:730-740, 1938. (*c*) Sanders, B.: Environment and Growth, Baltimore, Warwick & York, Inc., 1934, p. 163.

2. MacCarthy, F. H.: The Healthy Child from Two to Seven, New York, The Macmillan Company, 1922, p. 167.

3. Jeans and Stearns,[1b] pp. 733-734.

4. Bowditch, H. P.: The Relation Between Growth and Disease, Tr. A. M. A. **32**:371-377, 1881.

5. Woodbury, R. M.: Statures and Weights of Children Under Six Years of Age, Publication 87, United States Department of Labor, Children's Bureau, 1921.

6. Turner, C. E.; Lougee, W. W.; Sarabia, K., and Fuller, R. P.: Rate of Growth as a Health Index, Research Quart. (no. 3) **6**:29-40, 1935.

7. Palmer, C. E.: The Relation of Body Build to Sickness in Elementary School Children, Am. J. Phys. Anthropol. (supp.) **21**:7-8, 1936.

8. Hardy, M. C.: Frequent Illness in Childhood, Physical Growth and Final Size, Am. J. Phys. Anthropol. **23**:241-260, 1938.

9. Martens, E. J., and Meredith, H. V.: Illness History and Physical Growth: I. Correlation in Junior Primary Children Followed from Fall to Spring, Am. J. Dis. Child. **64**:618-630 (Oct.) 1942.

10. Sontag, L. W., and Lipford, J.: The Effect of Illness and Other Factors on the Appearance Pattern of Skeletal Epiphyses, J. Pediat. **23**:391-409, 1943.

of the growth in size of body of children having different specific diseases or having diseases classifiable in different relatively homogeneous groups.

EXPERIMENTAL MATERIAL

Subjects.—The subjects used for this investigation were 93 children of Iowa City, who were enrolled in the preschool laboratories of the Iowa Child Welfare Research Station during the period 1937 to 1942 inclusive. As will be explained later, no attempt was made to include every child enrolled during these years. The children were all white and were predominantly of northwest European ancestry. An analysis of the occupations of the fathers of the children showed that 64.5 per cent of the fathers followed professional occupations or had important managerial positions, 28 per cent were merchants or had minor managerial positions and the remaining 7.5 per cent were skilled laborers. The ages of the children at the initial, or fall, measurement varied from 2 years and 7 months to 5 years; at the second, or spring, measurement each child was 6 months older.

Data.—The anthropometric records employed were obtained routinely over the years encompassed by the study. Care was taken in the training of anthropometrists and in the maintenance of a rigorous technic. The procedures followed were those recently in use at the Iowa Child Welfare Research Station; they have been described in a publication by Knott.[11] All measurements were taken independently by two anthropometrists. From the fairly extensive series of measurements available the following were selected for use in the present investigation: stature; girth of arm; girth of leg; width of hip; circumference of chest; weight, and thickness of skin and subcutaneous tissue.

PROCEDURE

During the interim of six months between the fall and spring measurements daily records of absence for illness were obtained by a qualified nurse. She telephoned the homes of the children who were absent and kept a careful record of the reasons for absences. On the basis of these records the children were classified into five groups: group I, healthy children, who had been absent from preschool not more than a total of fourteen days during the six month period and who had had no single illness of more than two days' duration or classifiable as other than a minor cold or a minor digestive disturbance; group II, children who had been absent upwards of twenty-five days for minor infections of the respiratory tract; group III, children absent for prolonged illnesses, such as pneumonia and bronchitis; group IV, children absent for varying periods with either measles or chickenpox, and group V, children absent for at least twenty-five days because of both infections of the respiratory tract and digestive disorders. To be used as a subject, then, a child had to be classifiable either in group I (healthy children) or in one of the four groups that had illness. It follows that a child who had a moderately severe cough for two weeks in addition to measles would be excluded from the study as not clearly representative of either group IV (children with measles and chickenpox) or group II (children with mild infections of the respiratory tract). Five of the 93 subjects had records which fulfilled one of the specifications listed for two consecutive six month periods. All of these records were used, so that a total of 98 records was available for the entire study.

Gains in the seven dimensions of the body over the six month period were obtained for each child and averages for each group computed. The averages of each of the groups subject to illness were compared with those of the healthy group. These comparisons were directed toward answering such questions as the following:

1. Do children who have frequent and severe colds during the winter months gain less in stature than children who are healthy?

2. Are the children who gain most in weight from fall to spring more healthy than those who gain least?

3. Does the girth of arm of children who have measles increase less rapidly than the girth of arm of healthy children?

OBSERVATIONS

Comparison of Group I and Group II

Group I was composed of 30 children who were absent from preschool for illness less than fifteen days during a six month period. As has been stated, no child was included in this group who had anything more than minor digestive disturbances or colds of one or two days' duration. Group II consisted of 34 children each of whom was absent for colds and/or coughs twenty-five days or more during a six month period. The distribution of the number of days absent for children in each of the two groups may be summarized as follows:

Days Absent from Preschool for Illness During a Fall to Spring Period of Six Months

	No. of Children	Mean	Minimum	Maximum
Group I	30	9.2	4	14
Group II	34	35.9	25	59

For each child in group I or group II increment values were derived, calculated from measurements of the body taken in the fall and again in the spring, after an interval of six months. The distributions of increments which resulted are epitomized in table 1.

TABLE 1.—*Semiannual (Fall to Spring) Gain and Loss by Children in Seven Physical Measurements*

	Group II (Children with Mild Illnesses of the Respiratory Tract)			Group I (Healthy Children)		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Weight, lb.	2.16	—1.56	5.70	2.55	—0.28	6.35
Stature, mm.	36.1	23.0	46.0	38.0	28.0	53.0
Chest girth, mm.	4.7	—20.0	23.0	8.2	—15.0	21.0
Hip width, mm.	4.5	— 2.0	9.0	4.7	— 3.0	8.5
Arm girth, mm.	1.9	—15.0	10.0	1.1	— 8.0	8.0
Leg girth, mm.	3.6	— 9.0	12.0	4.0	— 3.0	10.0
Thickness of skin and subcutaneous tissue, mm.	—2.82	—16.0	6.0	—2.07	—10.0	4.5

11. Knott, V. B.: Physical Measurement of Young Children: A Study of Anthropometric Reliabilities for Children Three to Six Years of Age, Studies in Child Welfare, Iowa City, University of Iowa, 1941, vol. 18, no. 3.

The gains of group I (healthy children) in girth of chest, stature and weight were slightly greater than those of group II (children with mild illnesses of the respiratory tract). The two groups yielded almost identical means for girth of leg and width of hip, while the mean increase in girth of arm was slightly smaller for group I than for group II. The thickness of the subcutaneous fat (which here represents the sum of measurements of thickness taken over the abdomen, on the back of the arm and at the rear of the chest) is known to show a generally decreasing trend during the age period covered in the present study.[12] The means for loss in fatty tissue shown in the tabulation just given indicate that this loss was smaller for the healthy children (group I) than for those with mild illnesses of the respiratory tract (group II).

In order to determine whether or not the two groups were significantly different in any of the seven measures of rate of growth the *t* test was applied.[13] It was found that in no dimension was the difference in gains for the two groups statistically significant (the values of *t* fell between 0.03 and 1.46).

Comparison of Group I and Group V

Group I (healthy children) has been previously described. Group V was composed of 14 children with mild illness of the respiratory and digestive tracts. Included here were such illnesses as "stomach upset and cold" and "cold, temperature and stomach disturbance." The distribution of number of days absent for these two groups may be summarized as follows:

Number of Days Absent from Preschool for Illness During a Fall to Spring Period of Six Months

	No. of Children	Mean	Minimum	Maximum
Group I.....	30	9.2	4	14
Group V.....	14	44.1	27	79

12. Meredith, H. V.: The Rhythm of Physical Growth: A Study of Eighteen Anthropometric Measurements on Iowa City White Males Ranging in Age Between Birth and Eighteen Years, Studies in Child Welfare, Iowa City, University of Iowa, 1935, vol. 11, no. 3. Boynton, B.: The Physical Growth of Girls: A Study of the Rhythm of Physical Growth from Anthropometric Measurements on Girls Between Birth and Eighteen Years, ibid., 1936, vol. 12, no. 4.

13. Lindquist, E. F.: Statistical Analysis in Educational Research, Boston, Houghton Mifflin Company, 1940, pp. 51-54.

These comparisons parallel those of the previous section. The distributions which results are statistically reduced in table 2.

TABLE 2.—*Semiannual (Fall to Spring) Gain and Loss by Children in Seven Physical Measurements*

	Group V (Children with Mild Illnesses of the Respiratory and Digestive Tracts)			Group I (Healthy Children)		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Weight, lb.....	2.08	—0.15	4.0	2.55	—0.28	6.5
Stature, mm.....	34.2	25.0	43.0	38.0	28.0	53.0
Chest girth, mm.....	5.4	—4.0	27.0	8.2	—15.0	21.0
Hip width, mm.....	4.1	1.0	8.0	4.7	—3.0	8.5
Arm girth, mm.....	4.5	—5.0	12.0	1.1	—8.0	8.0
Leg girth, mm.....	4.7	—5.0	11.0	4.0	—3.0	10.0
Thickness of skin and subcutaneous tissue, mm.....	—2.60	—8.0	3.0	—2.07	—10.0	4.5

Compared with the mean gains for group I, the mean gains for group V tended to be larger for girth of arm and of leg and smaller for weight, stature, girth of chest, and width of hip. Group V lost more in thickness of skin and of subcutaneous tissue than did group I.

As in the case of the previous comparison, the Fisher *t* test was employed. With one exception the *t* values were not statistically significant at either the 1 per cent or the 5 per cent level of confidence. For girth of arm, $t = 2.34$; this, however, will be seen to imply that the group having mild illnesses of the respiratory and digestive tracts showed a greater gain in girth of arm over the six month period than did the healthy group.

Comparison of Group I and Group IV

Group I (healthy children) has been previously described. Group IV was composed of 11 children who during the half-year period had measles or chickenpox, uncomplicated by other significant illness. Of these 11, 7 had chickenpox and 4 had measles. The following is a summary of the number of days absent from preschool:

Days Absent from Preschool for Illness During a Fall to Spring Period of Six Months

	No. of Children	Mean	Minimum	Maximum
Group I.....	30	9.2	4	14
Group IV.....	11	32.0	19	57

Statistical reduction of the distributions of increments for the two groups are presented in table 3.

TABLE 3.—*Semiannual (Fall to Spring) Gain and Loss of Children in Seven Physical Measurements*

	Group IV (Children with Measles or Chickenpox)			Group I (Healthy Children)		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Weight, lb.	2.44	0.3	6.4	2.55	—0.28	6.35
Stature, mm.	36.1	25.0	48.0	38.0	28.0	53.0
Chest girth, mm.	5.8	—1.0	24.0	8.2	—15.0	21.0
Hip width, mm.	5.6	1.0	10.0	4.7	—3.0	8.5
Arm girth, mm.	3.1	—4.5	15.0	1.1	—8.0	8.0
Leg girth, mm.	5.9	—2.0	13.0	4.0	—3.0	10.0
Thickness of skin and subcutaneous tissue, mm.	—0.35	—8.0	1.0	—2.07	—10.0	4.5

The means here do not indicate any definite trend. It will be seen that group I showed a more rapid rate of increase in circumference of chest, stature and weight, while the "measles-chickenpox" group made slightly greater gains in girth of arm, girth of leg, and width of hip. The healthy children lost more subcutaneous fat than did those who had measles or chickenpox.

Again the Fisher *t* test was used to determine whether or not the two groups differed significantly in amounts of growth. In no instance did *t* exceed 1.70. It follows that there is no basis for rejecting the hypothesis that both groups represent the same increment populations.

Comparison of Group I and Group III

Group I (healthy children) has already been described. Group III was comprised of 9 children whose health histories showed severe or prolonged mumps, infection of tonsils, influenza, bronchitis or pneumonia. The following tabulation summarizes the records of absence:

Days Absent from Preschool for Illness During a Fall to Spring Period of Six Months

	No. of Children	Mean	Minimum	Maximum
Group I.	30	9.2	4	14
Group III.	9	58.3	13	145

A reduction of the seven increment distributions for each group is shown in table 4.

TABLE 4.—*Semiannual (Fall to Spring) Gain and Loss of Children in Seven Physical Measurements*

	Group III (Children with Prolonged Illnesses)			Group I (Healthy Children)		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Weight, lb.	2.00	0.9	4.3	2.55	—0.28	6.35
Stature, mm.	37.3	29.0	43.0	38.0	28.0	53.0
Chest girth, mm.	7.1	—1.0	17.0	8.2	—15.0	21.0
Hip width, mm.	5.6	3.0	7.0	4.7	—3.0	8.5
Arm girth, mm.	1.8	—4.0	10.0	1.1	—8.0	8.0
Leg girth, mm.	7.6	4.0	13.0	4.0	—3.0	10.0
Thickness of skin and subcutaneous tissue, mm.	—2.3	—7.0	6.0	—2.07	—10.0	4.5

Again, no systematic difference is obtained between the means. Group I lost less in thickness of subcutaneous tissue, gained more in stature and girth of chest and gained less in girth of arm and of leg than did group III.

In an attempt to discover whether the gains of the two groups were significantly different, the *t* test was used. At the 1 per cent level of confidence there is no evidence that the two groups differed in rate of growth. For one item only, gain in girth of leg, did the two groups differ significantly at the 5 per cent level of confidence. For these particular samples it will be noted that the gains in girth of leg were higher for the group with prolonged illnesses than for the healthy group.

ANALYSIS OF FOUR CASES FROM GROUP III.

CASE 1.—K. C., a girl whose age at the initial fall measurement was 3 years and 5 months, was absent for illness a total of ninety-two days during the ensuing six month period. The causes of her absences were as follows: inflammation of the throat, cold, nasal discharge and infection of the tonsils (causing an absence of six weeks), removal of tonsils and adenoids. The following tabulation compares her increments with the mean increments of the "healthy" group:

Comparison of Gains of K. C. with Means of Group I (Healthy Children)

	K. C.	Group I
Weight, lb.	4.3	2.55
Stature, mm.	43.0	38.0
Chest girth, mm.	9.0	8.2
Hip width, mm.	7.0	4.7
Arm girth, mm.	6.0	1.1
Leg girth, mm.	10.0	4.0
Thickness of skin and subcutaneous tissue, mm.	—1.0	—2.07

In every body dimension studied K. C. gained more than the mean gain of group I.

CASE 2.—M. S., a boy 4 years and 6 months old at the time of the initial fall measurement, was absent for illness a total of fifty-three days during the succeeding six months. Items included in his history of illness were: hoarseness; cold, and cold, temperature and influenza (causing an absence of six weeks). The following tabulation compares his increments in seven aspects of body size with those of group I:

Comparison of Gains of M. S. with Means of Group I

	M. S.	Group I
Weight, lb.	3.1	2.55
Stature, mm.	29.0	38.0
Chest girth, mm.	17.0	8.2
Hip width, mm.	6.0	4.7
Arm girth, mm.	10.0	1.1
Leg girth, mm.	4.0	4.0
Thickness of skin and subcutaneous tissue, mm.	0.0	—2.07

M. S.'s increments will be seen to exceed those of group I except for girth of leg and for stature.

CASE 3.—P. C., a girl whose age at the initial fall measurement was 3 years and 9 months, was absent for illness a total of fifty-seven days during the following

six month period. Her illnesses were as follows: cold, cold, influenza and pneumonia (causing an absence of six weeks), and minor cold. A comparison of her body growth with that for group I follows:

Comparison of Gains of P. C. with Means of Group I

	P. C.	Group I
Weight, lb.	1.6	2.55
Stature, mm.	38.0	38.0
Chest girth, mm.	1.0	8.2
Hip width, mm.	6.0	4.7
Arm girth, mm.	2.0	1.1
Leg girth, mm.	8.0	4.0
Thickness of skin and subcutaneous tissue, mm.	—3.0	—2.07

It will be seen that P. C. gained more than did group I in girth of arm, girth of leg and width of hips. She gained identically with group I in stature. In weight and girth of chest P. C.'s gains were less than the mean gains of group I.

CASE 4.—L. M., a boy whose age at the initial fall measurement was 3 years and 9 months, ws absent for illness a total of one hundred and forty-five days during the ensuring six months. His absences from preschool were recorded as follows: minor cold and pneumonia due to streptococcic infection (white cell count low; this notation covered an absence of four and one-half months). This child, then, was below par physically for over two thirds of the period covered. His gains as compared with the mean gains of the healthy group are presented in the following tabulation:

Comparison of Gains of L. M. with Means of Group I

	L. M.	Group I
Weight, lb.	2.9	2.55
Stature, mm.	36.0	38.0
Chest girth, mm.	2.0	8.2
Hip width, mm.	5.0	4.7
Arm girth, mm.	1.0	1.1
Leg girth, mm.	9.0	4.0
Thickness of skin and subcutaneous tissue, mm.	—1.0	—2.07

L. M.'s gains will be seen practically to equal the mean gains for group I in stature, girth of arm and width of hip. In weight and in girth of leg L. M.'s gains were the higher, while in chest girth the mean of group I was the higher.

SUMMARY

The present investigation is intended to contribute to a solution of the general problem of the relationship between illness and physical growth. Specifically, its purpose is to compare the growth over a six month period of children classified in five groups on the basis of records of their illnesses.

The subjects were 93 children between the ages of 2½ and 5 years who were enrolled in the preschool laboratories of the University of Iowa. The histories of their illnesses were amassed through the medium of daily records compiled by an experienced preschool nurse. An anthropometric examination of each child was made in the fall and another after an interval of months. The children were grouped into classes according to their records of illne group I, healthy children; group II, child with mild illnesses of the respiratory tract; gr III, children with prolonged illness; group children with measles or chickenpox, and gr V, children with infections of both the respirat and the digestive tracts. Analyses were made gain or loss in seven anthropometric measu ments: stature, weight, girth of arm, girth of girth of chest, width of hip and thickness of s and of subcutaneous tissue.

The physical growth of the healthy group alined successively with that of each of the f groups having illness. By means of the *t* it was ascertained that in twenty-eight comp sons only two were statistically significant. gains in girth of arm for group I (healthy c dren) and for group V (children with m illnesses of the respiratory and digestive trac were significantly different at the 1 per cent le of confidence, and the gains in girth of leg group I (healthy children) and for group (children with prolonged illness) were sign cantly different at the 5 per cent level of c fidence. In both these instances the gains w greater for the groups having illness than for healthy group.

Individual study was made of 4 subjects abs for illness upward of fifty days each. When gains of these children were compared with mean gains of the healthy group no consist or marked differences were found.

It may be said, then, that the children w were absent from preschool because of illn gained approximately the same amount as the children who were almost entirely free fr illness.

In interpreting these results the fact that children came from homes of relatively h socioeconomic status must be borne in mi These children, presumably, received better th average care of their health at all times and w given special attention during illnesses. The children, too, were kept at home until such ling ing manifestations of illness as fatigue and li lessness had disappeared. It is possible that study done on children from homes of low socioeconomic levels might not yield the sa results as the present investigation.

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Case Reports

PYGOPAGUS TWINS

REPORT OF DISSECTION OF THE THORAX, ABDOMEN AND PELVIS

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IOWA CITY

The S. twins were admitted to Children's ospital, State University of Iowa, Iowa City, Aug. 14, 1942, at the age of 3 weeks. They d Dec. 7, 1942 and at that time were brought the department of anatomy for dissection. is paper is a report of the gross observations.

HISTORY

Janet and Judith S., Siamese twin girls, were born y 21, 1942 at Dubuque, Iowa. The father and ther were of white American stock, aged 26 and 21 rs respectively. These were their first children. ere was a history of twins on both the maternal and paternal side, but no other Siamese twins were own in the family.

The parents of the twins lived on a farm near New enna, Iowa, with the father's parents. The family l a moderately low income.

The twins were full term babies. Labor lasted nine- n hours, from 4:30 a. m. until 11:30 p. m. Capt. B. Hall, the physician who delivered the twins, sent following report concerning the placenta:

"The placenta was expressed easily after 1 ampule pitocin had been given intramuscularly, with minimal s of blood. The placenta was single, with a single rionic membrane enclosing both babies. The amni- c membrane was closely fused to the chorion, as ugh each baby had a separate amnion. The cords se 7 cm. apart on the fetal surface of the placenta. . . The placenta itself was of average thickness, id and slightly larger than normal in over-all asurement."

t is doubtful that each baby had a separate amnion; is more likely that there was a pouched condition, ich might have been mistaken for separate amnions. The weight of the twins at birth was 9 pounds 10 nces (4,366 Gm.). The right twin (Janet) was a ue baby." The point of union between the two was the region of the buttocks (fig. 1).

At the time they were admitted to the hospital the ins appeared dehydrated, and their weight was sub- rmal (4,300 Gm.). They had spina bifida and a mmon meningocele (fig. 2). On their admission to hospital both infants showed slight hydrocephalus. ere was an apparent defect in the ribs on the right e of the left twin (Judith). The anal opening was gle and in the line of union of the two infants, ward the posterior surface. The external genitalia re common to the twins. There was a single stibule which presented four separate, small openings the urethras and the vaginas. The extremities of left twin appeared normal. While the upper tremities of the right twin were normal, the lower extremities were poorly developed, and the right leg had not rotated completely. Except for the defective thorax the left twin appeared to be the better formed and sturdier of the two.

Roentgenograms were made of the children, and the report was as follows: "Roentgen studies of the entire bodies of the conjoined twins show them to be united at the sacral areas. Both appear to have complete innominate bones, but the centers of ossification for the sacra appear continuous, and the sacra appear to be joined. One twin demonstrates a spina bifida vara, and films of both skulls show a condition described as *Lückenschädel*. Except for the fusion of the sacra the skeletons appear complete and separate; both show anomalies of the ribs in the midthoracic regions."

The twins were first brought to my attention on Aug. 26, 1942, when a number of anthropologic measurements and observations were made. Measurements were taken again on Sept. 10, 1942. Attempts were made at different times to obtain prints of the fingers and hands for study.

The immediate cause of death was considered to be "respiratory paralysis" due to the Arnold-Chiari syndrome. Judith, the left twin, was pronounced dead at 8:15 a. m. on Dec. 7, 1942, and Janet, the right twin, at 8:50 a. m.

Necropsy.—After their death complete dissections were made of the thorax, the abdomen and the pelvis of each twin. The brains and the lower segments of the spinal cord were removed and preserved for future study. Although a complete dissection of the lower extremities would have been desirable, time was limited, and further work was impossible. Histologic sections were made of various organs and structures; a report will be made on them in a separate paper.

RIGHT TWIN (JANET)

The right twin seemed to be the more poorly developed. She was thinner than her twin and the lower extremities were defective. She had marked hydrocephalus, and the head was misshapen and skewed.

An incision was made along the entire anterior surface of the body, from the suprasternal notch to the pubis. Incisions were then made from the suprasternal notch laterally to the acromions. Skin and superficial fascia were reflected laterally, and the sternum and a portion of the ribs were removed.

Thorax.—When the thorax was first opened the organs appeared normal (fig. 3). The heart was normal in size and placed in the midline with the apex toward the left. The lungs appeared normal.

Lungs: On closer inspection the right lung showed the usual three lobes but was considerably larger than the left lung. Nothing unusual was noticed about the arrangement of the structures entering the root of the right lung. The left lung, while noticeably smaller

From the Department of Anatomy, State University Iowa.

than the right, showed normal configuration. It had two well defined lobes and a distinct cardiac notch. The posterior surfaces of both lungs showed marked ribbing, the soft tissue having been compressed by the defective thoracic wall. Most of the inferior lobe of the right lung and the posterior quarter of the left lung were consolidated, hard and dark red.

Thymus: The thymus was relatively large. It covered and hid the upper half of the heart and was closely applied to the pericardial sac laterally, separating it from the lungs on both sides. The thymus had a well developed medial lobe, which projected upward into

Figs. 1 and 2.—*1*, anterior view of twins. *2*, posterior view of twins, showing meningocele.

the neck, extending approximately 2 mm. above the suprasternal notch.

Heart: There was nothing unusual about the pericardium or the heart (fig. 3). The ductus arteriosus was patent, and the foramen ovale was partially open. The vessels arising from and entering the heart were normal in number and position.

Blood Vessels: The vessels supplying the organs of the thoracic area were similar to the normal organs described in Gray's "Anatomy"; nothing unusual enough to warrant description was encountered.

Nerves: The course and relationships of the vagus and phrenic nerves were normal.

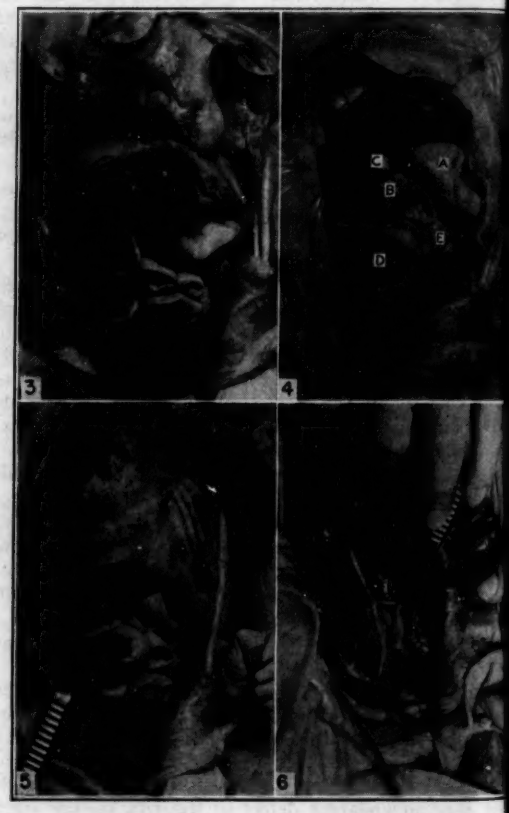
Abdomen.—When the abdomen was opened, the liver, stomach and intestines lay exposed (fig. 4). The greater omentum was not visible. The liver appeared normal in size and position. The small portion of the stomach which could be seen seemed to be placed a little too far to the left, and the long axis appeared to extend horizontally, with the pyloric portion hi than was expected. The coiled intestines were dif to differentiate, the small intestine being relatively l It was difficult to identify the cecum or the asce or transverse colon.

Liver: The liver appeared from the front to b normal size, but on closer inspection the poste inferior margin of the right lobe was found to ex down the back wall of the abdomen to approxim 1.5 cm. below a horizontal plane on a level with umbilicus. The falciform ligament was attache the diaphragm 7 mm. to the right of the tip of xiphoid process. The round ligament was large, the lumen was no longer patent.

Gallbladder: The gallbladder appeared norma size, position and color (fig. 4), as did the cystic

Spleen and Pancreas: The spleen and the panc showed nothing unusual enough to warrant descrip

Stomach and Intestines: The only features conc ing the alimentary tract which are of interest were variations in position of certain segments due to complete rotation of the intestines; the previo mentioned relatively large size of the small intest



Figs. 3 to 6.—*3*, thoracic and pelvic viscera of right twin. Note the large thymus, which parti hides the heart. *4*, abdominal viscera of the r twin: *A*, stomach; *B*, cecum; *C*, ileum; *D*, small in tines; *E*, transverse colon. *5*, photograph showing p tion of the cecum and the appendix in the right t *6*, the mesenteries for the alimentary tract of the r twin have been cut and the intestines removed from abdominal cavity in order to expose the urinary org their blood supply and the adrenal glands. Note position and the rotation of the right kidney. three divisions of the ureter are clearly visible.

r points of intussusception, and the presence of a entery in certain areas.

ecause of certain peculiarities in the position of the ge intestine and the relatively large size of the small stine it will be necessary to refer to figures 4 and 5 orientation. The stomach was displaced slightly to left, and the long axis was horizontal. The pyloric tion was directed posteriorly and lay to the left the gallbladder. The small intestine (ileum), which relatively large, the cecum and a small segment of transverse and the descending colon (fig. 4) were only portions of the large intestine visible when abdomen was opened. A portion of the ileum, roximately the lower one third, occupied the right er quadrant, taking the position normally occupied the cecum and the ascending colon. In figure 4 the minal part of the ileum can be seen in its relation- with the cecum on the right and the pyloric portion the stomach on the left. The duodenum lay behind last portion of the ileum (fig. 4). The cecum, tead of being in the lower right quadrant as would be ected, was pressed closely against the under surface the right lobe of the liver. The appendix measured m. and was located between the cecum and the liver g. 5). The ascending colon zigzagged transversely m right to left several times before it was intus- cepted into the transverse colon, and it carried with the greater omentum and the mesentery of the ending colon. The course and relationship of the cending and the sigmoid colon and of the rectum e normal. Both the descending portion of the colon l the rectum were smaller in diameter than the rest the intestinal tract. In addition to the intussusception the ascending colon into the transverse colon, there re three areas of intussusception in the small intestine. obably these four areas of intussusception represent nal changes at the time of death and were not a tributing factor in the death of this twin. The itions of the various segments of the intestine were licative of its incomplete rotation. The possibility arrested development of the large intestine is further stantiated by the presence of a mesentery through- the entire length of the large intestine. The shortest sentery was found for the upper part of the descend- colon.

Adrenal Glands: Both the right and the left adrenal nd in the right twin were large (fig. 6). The left renal gland, which was the smaller of the two, was ced directly above and in close contact with the per pole of the left kidney. The right adrenal gland s large and was pressed between the posterior surface the right lobe of the liver and the diaphragm. Its wer border was 1.3 cm. above the superior pole of right kidney (fig. 6).

Kidneys: The right kidney was larger than the left d placed much lower in the abdomen. The shape was storted, as is shown in figure 6. The right kidney s rotated on its long axis so that the pelvis of the eter was directed anteriorly and laterally. The lower le of this kidney was on a plane 6 mm. below the furcation of the abdominal aorta. The upper pole as opposite the origin of the inferior mesenteric artery. hree arteries entered the right kidney; their origin d distribution will be discussed later. The venous turn was by way of a main renal vein from the hilus d two small tributaries from the superior pole of the dney. The left kidney appeared normal in both size d position. The lower pole of the left kidney was pposite a point 3 mm. below the origin of the inferior esenteric artery, and the upper pole was 5 mm. below e origin of the superior mesenteric artery. There as a single artery which entered at the hilus of the dney. The renal vein was large.

Ureters: The ureter on the right showed a peculiarity in its mode of origin. Instead of starting as a single pelvis from the hilus of the kidney, it began as three separate small pelves (fig. 6), which joined to form a single ureter. The ureter on the left side was normal. Both ureters were normal in size and in their relationships and emptied into the bladder in the usual manner.

Blood Vessels: In general the blood vessels in the abdominal region showed no unusual variations. Mention should be made, however, of those supplying the right kidney. Three separate arteries, all derived from the aorta, supplied this organ (fig. 6). The highest artery was intermediate in size. It arose from the right side of the aorta opposite the origin of the inferior mesenteric artery. It extended laterally to the right and slightly downward to enter the superior pole of the kidney. The middle and largest of the three arteries arose 7 mm. below the inferior mesenteric artery and extended laterally to the right and downward to enter the hilus of the kidney. (Because of the lateral rotation of the kidney on its long axis, the artery crossed the kidney to enter on its anterior surface.) The third and smallest of the right renal arteries took its origin 1.3 cm. below the inferior mesenteric artery. It crossed behind the second renal artery to enter the kidney on its posterior surface at a point opposite the hilus. The left renal artery took its origin from the descending aorta 2 mm. above the inferior mesenteric artery and entered the kidney at the hilus.

The venous drainage from the right kidney was by one main vein from the hilus and two small tributaries from the superior pole of the kidney. These vessels drained into the inferior vena cava. The large left renal vein left the hilus of the kidney, crossed posterior to the aorta and entered the inferior vena cava 6 mm. above its origin.

Nerves: The vagus and splanchnic nerves entered the abdominal region in the usual manner. No attempt was made to work out the details of the various plexuses.

Pelvis.—Bladder: The middle umbilical ligament and fold were prominent. Where the middle umbilical ligament left the vertex of the bladder, it presented a hard pyramidal-shaped portion, the base of which rested on the bladder and the apex of which projected upward (fig. 6). There was a well developed lateral umbilical ligament on the right side, but none was found on the left side. The bladder was of moderate size and conformed to the usual descriptions of the bladders of infants. It was apparently occluded, since it could not be decompressed. On being opened it was found to contain air and a clear, almost colorless fluid. On probing, an obstruction was found at the neck of the vesicle. Since the bladder was not abnormally distended, the obstruction was probably produced by strong contraction of the sphincter vesicae shortly before or at the time of death. As might be expected from the fusion of the twins in the pelvic region and the close relationship of the urethras and genital organs of the right and left twins, the bladders in their lower parts and the urethras were closely bound together by dense, fibrous connective tissue. The urethra of the right twin was patent but greatly constricted at the internal orifice. It began at the apex of the trigone vesica; the external orifice may be seen as the upper left opening in figure 18.

Genital Organs: The reflection of the peritoneum was the same as is usually described except for one or two variations, which will be mentioned briefly during the description. The peritoneum formed a short mesovarium as it was reflected on the ovary; then it extended back to the posterolateral wall on the right side,

fastening the organs snugly to the posterior abdominal wall. On the right side the ovary lay almost vertically; the superior pole (the one nearest the fimbriated extremity of the uterine tube) was directed slightly laterally. The tube lay lateral to the ovary, and the fimbriated extremity was folded back on itself. The ureter was directly posterior and closely applied to the tube. The superior pole of the right ovary overlapped the inferior pole of the right kidney approximately 2 mm. The right ovary was narrow, thin and elongated and was oddly club shaped. It was 2.6 cm. in length, while its upper and widest part measured 6 mm. It then tapered to only 3 mm. at a point 3 mm. from its distal tip. The left ovary was the usual oval shape, 1.5 cm. long, 8 mm. wide and approximately 3 mm. thick. On the left side the lower pole of the kidney was approximately 2.5 cm. above the upper pole of the ovary.

On a level with the left ureter the peritoneum left the posterolateral wall to reflect and form the mesentery for the lower part of the colon and the rectum. What appeared to be a poorly developed broad ligament containing ovaries and uterine tubes was observed. The organs on the left side lay at a lower level (distally) than the ones on the right side. The difference between the superior poles of the ovaries on the right and left sides was approximately 1 cm.

The uterus was deep in the pelvic cavity between the bladder and the rectum. The long axis of the uterus was in a straight line with the long axis of the vagina. The uterus was flattened anteroposteriorly and presented a concave surface posteriorly both from side to side and from apex to base. It was not truly piriform when viewed from the front, but was shaped more like the sole of a slipper. The left uterine tube entered the upper left margin of the uterus; on the right side the tube entered slightly lower than on the left side. The vaginal portion of the uterus projected into the vagina about 3 mm. The lips of the uterus were smoothly rounded and seemed to be of about the same size.

The vagina extended from the uterus to the vestibule. In its entire extent it was closely bound to the vagina of the left twin. At the vestibule the medial walls of the two vaginas were of the same thickness as the septums separating the two orifices.

Blood Vessels: Those blood vessels which were dissected in detail conformed for the most part to the descriptions in Gray's "Anatomy," only minor variations being encountered. The only vascular connection found between the twins was the anastomosis between the middle sacral arteries. These arteries were unusually large (figs. 19 and 20).

Nerves: No attempt was made to work out the details of the nerves in this region.

LEFT TWIN (JUDITH)

At the time of the dissection the left twin seemed to be fairly well nourished. She showed a defect in the region of the thorax on the right side, where the bony ribs were missing. Like the right twin, she had extreme hydrocephalus and a badly misshapen head.

The body was opened in the same manner as was reported for the right twin.

Thorax.—When the thorax was opened the organs were found to be abnormal in size and in position. Part of the disarrangement was due to the displacement produced by the extremely large size of the liver and the resulting encroachment of this organ on the thoracic area. The large size of the right lung is evident from figure 7. It was wider from side to side than from apex to base, and it extended beyond the midsagittal line about 1 cm. onto the left side of the thorax. The heart was also displaced toward the left, the entire organ lay to the left of the midsagittal line. The apex of the heart was directed to the left. The left lung was small, atelectatic and deep red. It could scarcely be seen from the front. Figure 8, which is a lateral view, shows the left lung in its relation to other thoracic organs. The thymus was large. The right edge of the thymus came to the midsagittal line, the rest of the organ was displaced to the left and covered the upper half of the heart (figs. 7 and 8).

Lungs: When the lungs were examined more closely both showed the normal number of lobes, but the ca

Figs. 7 to 10.—*7*, thoracic and abdominal viscera of the left twin. Note the extremely large liver. The large right lung, which is rotated, extends beyond the midline. The heart is crowded to the left. The left lung is small, and only a small portion can be seen. *8*, photograph of viscera of the left twin taken from the left side. Observe the compressed atelectatic left lung. The heart is large and partially covered by the large thymus gland. The extremely large left lobe of the liver almost completely hides the intestines. *9*, photograph of the left twin showing the position of the cecum and the appendix. *10*, abdominal viscera of the left twin: *A*, stomach; *B*, cecum; *C*, small intestines.

diac notch on the left lung was indistinct. The right lung was found to be rotated so that the fissures, instead of being in a horizontal plane, were turned until they were directed nearly vertically. Because of the twisting and distortion of the lung, the tissue of the right lung overlay the vessels, the right atrium and most of the right ventricle of the heart. The lateral edge of the right lung showed an area of consolidation and was dark red. There was a depression on the

erior surface (apex) due to a thoracic deformity. left lung was small, dark red and atelectatic. y the lower tip of this lung could be seen from the t (fig. 7). However, the lung extended down and ind the heart and was almost hidden by it. A lat- view showed it to be long, thin and crowded rally by the pressure of the other organs. The ectasis is probably due to mechanical pressure; mination of the trachea and the bronchus showed evidence of any obstruction in the bronchial tree. posterior surfaces of both lungs showed slight bbing," but it was not as marked as in the right n.

Thymus: The thymus was large and lay completely the left of the midsagittal plane of the thorax. It ered the upper half of the heart. Two "tongues" thymic tissue extended into the neck. The right gue projected 1 cm. above the suprasternal notch; left, which was longer, extended 1.5 cm. upward.

Heart: This organ was of good size but was crowded ard the left and was rotated so that the superior a cava was anterior. Both atria and both auricles e large. The surface of the ventricles was rough shrunken looking, but there were no adhesions to pericardium. The ductus arteriosis was patent, and foramen ovale was not closed. The pulmonary ery lay to the left and on a plane posterior to the erior vena cava. The aorta lay to the left and ind the superior vena cava.

Blood Vessels and Nerves: The peculiarities which e encountered in the blood vessels and the nerves e due to abnormalities in the position of the organs plied by these structures rather than to anomalies the vessels or nerves themselves.

Abdomen.—The most startling thing about the abdom- l organs at the first glimpse was the extremely large er (fig. 7), which filled the entire upper half of the dominal cavity. Superiorly it extended upward as h as the nipple line, causing compression and disar- ngement of the thoracic structures. The left lobe s very large and extended downward to the level of umbilicus. The falciform ligament lay to the left the midsagittal line. The round ligament was prom- nt but was occluded. The stomach showed below right lobe of the liver and lay in a horizontal ne. The omentum was gathered tightly against the eater curvature of the stomach and did not cover intestines as the normal omentum does. The ar- ngement of the large intestine was confusing at first nce. The cecum was on the left (fig. 9) and at first s thought to represent a partial situs inversus, but ser examination showed that here again the intestine d failed to rotate completely. The difference in size tween the large and small intestines was apparent, d less difficulty was encountered in differentiating em than in the case of the right twin. The orien- ion of the rest of the intestines can best be accom- shed by referring to figure 10.

Liver: The liver was prominent. The left lobe rticularly was extremely large and extended to the t side of the abdominal wall. The lower extremity the left lobe, which extended downward to the level the umbilicus, crowded the intestines toward the dline, distorting their arrangement. Because of the rge size of the liver and the changed relationships of e abdominal structures, the normally well defined pressions on the inferior surface of the liver were int and poorly marked. There were, however, well veloped caudate and quadrate lobes. On the postero- teral surface of the right lobe there was a prominent ass of hepatic tissue which projected as a "tongue" to the fossa (caused by a skeletal defect) on the posterolateral wall of the abdomen. This tongue of hepatic tissue was hard and dark red, which indicated an area of marked congestion.

Gallbladder: The gallbladder was of normal size, color and position. It was moderately filled with bile. The cystic duct and the common duct appeared to be normal.

Spleen and Pancreas: The spleen lay directly in the midline plane of the body, crowded between the right and left lobes of the liver. Its long axis was directed almost vertically, the lower pole of the spleen being slightly to the left of the upper pole. In this position it was forced behind the esophagus, which almost completely hid it. Except for this disarrangement in its position the spleen appeared normal.

There was nothing about the pancreas so significantly different as to warrant description.

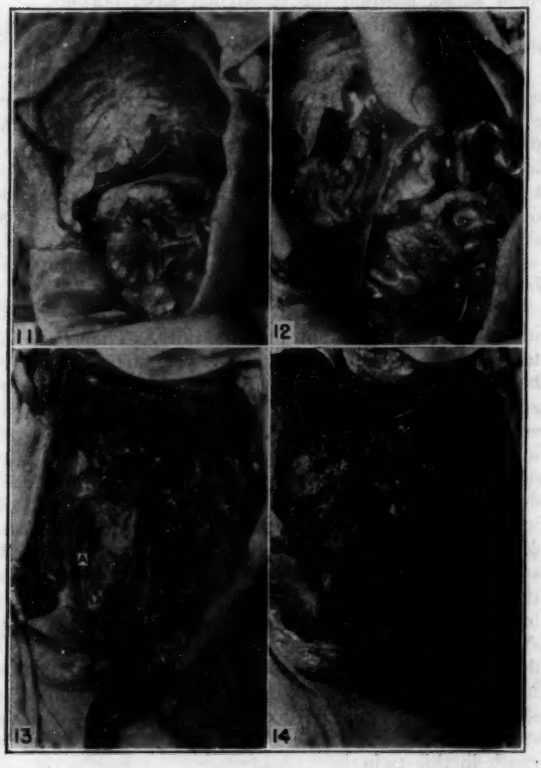
Stomach and Intestines: The stomach was large; approximately half of it protruded below the margin of the liver. Its long axis was directed in a horizontal plane. The pyloric portions (the antrum and the pylorus) were pressed against the gallbladder, and the upper surface was stained with bile. On the right side of the cardiac portion of the stomach was a large eroded area, showing the effect of postmortem autolysis; this area was pressed firmly against the neighboring liver.

No attempt will be made to describe in detail the intricate arrangement of the intestines. The small intestine filled the middle and the lower part of the right half of the abdomen. The duodenum lay below the posterior half of the right lobe of the liver and was entirely hidden by folds of the ileum and of the ascending and the transverse colon. The jejunum was also deeply located in the upper right quadrant of the abdomen. The greater part of the coils of the small intestine was disposed in the middle and lower parts of the abdomen (fig. 10). The terminal portion of the small intestine appeared just below the extreme right tip of the stomach, extended downward and curved left to enter the posteromedial surface of the cecum. About midway along the small intestine there was a double intussusception (fig. 11). When this was examined, it appeared to be due to postmortem changes, since there was no evidence of gangrene or other indication that it might have been the primary cause of death in this twin.

The cecum lay to the left of the midsagittal plane and was partially hidden by the left lobe of the liver. The appendix, which measured 3.1 cm., came off the medial side of the cecum; the terminal half and the tip of the appendix were folded back on the first half and directed forward and medially. The ascending colon lay first along the left abdominal wall for a short distance and then extended transversely to the right. The transverse segment of the colon began at the right side of the abdomen, where the ascending colon made a U turn. The terminal portion of the transverse colon lay behind the descending colon and below the stomach. The descending colon lay along the back of the abdominal cavity approximately 1.5 cm. lateral to the midline. It extended downward along the lateral margin of the left kidney; a short distance distal to the lower pole of the kidney the colon turned medially to enter the sigmoid portion. The sigmoid colon and the rectum showed nothing unusual in position or relationships. There was a well developed mesentery for the entire intestinal tract. The mesentery for the cecum was particularly long and well developed (fig. 12). The shortest mesentery was in the region of the descending colon. Again, what appeared at first glance to be an example of partial situs

inversus turned out to be arrested development with incomplete rotation of the intestine.

Adrenal Glands: The adrenal glands were both large (fig. 13). The left was the smaller of the two. It was roughly triangular in shape and lay directly above the left kidney and at a somewhat lower level than the right adrenal gland. The right adrenal gland was a large organ somewhat semilunar in shape. Its upper half was in contact with the diaphragm posteriorly and covered a relatively large defect in the thoracic cage and the diaphragm to the right of the vertebral column. There was a prominent projection of the adrenal tissue on the posterior surface of the upper half of the gland that fit and filled the fossa produced by the bony de-



Figs. 11 to 14.—*11,* double intussusception of the large intestine in the left twin. *12,* abdominal viscera of the left twin. Notice the well developed mesentery extending across to the cecum. *13,* the mesenteries of the left twin have been cut and the intestines pulled to one side in order to expose the posterior abdominal wall. Note the distended left ureter. There was no kidney on the right side. The peculiarly shaped structure (*A*) was found to be an ovary and a uterine tube. *14,* abdominal viscera of the left twin. The right adrenal gland has been reflected toward the midline. The probe is lifting the sympathetic nerve trunk.

formity and the diaphragmatic deficiency. The sympathetic chain of fibers entered the abdomen through the hiatus in the diaphragm behind the right adrenal gland (fig. 14).

Kidneys: There was only a left kidney in the left twin, and it was large and placed relatively low. The inferior pole was in a plane on a level with the bifurcation in the abdominal aorta. The left ureter was irregular in size throughout its course. At the pelvis it lay deep to the arteries and the vein, being directly in relation with the artery. As it left the kidney it was about the same size as the ureters in the right twin. At a distance of 4 cm. from the hilus of kidney the diameter of the ureter was exactly tripl then it again became somewhat smaller. The wall the dilated portion was very thin. The cause of dilatation was not determined, since the opening i the bladder seemed patent. On the right side th was no kidney or evidence of any remnant of one. the posterior abdominal wall on the right side th was an odd structure which measured 3.1 cm. in leng This structure lay retroperitoneally, and its long a was directed vertically (fig. 13). Histologic exami tion showed it to be the ovary and the uterine tu

Blood Vessels: The abdominal aorta entered abdominal cavity through the aortic hiatus. It exten downward behind the right lobe of the liver, lying the right of the inferior vena cava. Within a relati short distance it crossed deep to the vena cava a assumed its normal relationship to this vessel. It t minated at the level of the fifth lumbar vertebra, the two common iliac arteries.

Only two variations in the blood vessels of the dominal region warrant discussion. The left gast artery arose as a separate artery from the aorta short distance above the origin of the celiac axis. supplied branches to the left adrenal gland and left side of the diaphragm, and its terminal branc supplied the lesser curvature of the stomach.

There were four arteries which supplied the kidney. They all arose from the left lateral side the aorta below the superior mesenteric artery. T highest, and smallest, artery supplied the upper p of the kidney, and the remaining three entered at hilus. Two veins arose from the kidney and uni to form the renal vein, which crossed above the ao and entered the inferior vena cava. At the junct of the two renal tributaries was a smaller vein, wh connected the renal veins with the inferior vena ca 3 cm. below the entrance of the large renal vein. T small vessel ran below the aorta. The large renal v also received a small tributary vein from the adrenal gland.

The inferior vena cava lay above and to the ri of the aorta in its lower three quarters. The oth smaller veins accompanied and corresponded to th companion arteries.

Nerves: The sympathetic trunk entered the abdo inal cavity through the large hiatus in the diaphra previously described. As the trunk entered the a domen it was completely hidden by the right adre gland (fig. 13). When the adrenal gland was reflect medially, the sympathetic chain was clearly se (fig. 14). Directly under the gland the sympathe chain broke up into three terminal strands. The up two entered the adrenal gland on the right, while t lowest, and largest, strand continued medially a downward along the lateral margin of the verteb column. Detailed dissections of the various abdomi plexuses were not attempted.

Pelvis.—Bladder: There were a well developed m dial umbilical fold and two large, well developed l eral umbilical folds. The bladder was normal a followed the usual anatomic descriptions. There w a remnant of a structure on the right side of the bla der that seemed to correspond to the ureter on the le This cordlike structure extended along the poster abdominal wall on the right side to approximately cm. above the level of the bifurcation of the aor where it seemed to be gradually lost in the underlyi fascia. Its lower part entered the lateral angle of t bladder. The reflection of the peritoneum followed t usual descriptions with few exceptions. On the ri side, because of the presence of the peculiarly elonga

ry and uterine tube, it reflected around the right e of the uterus and then flattened out over the lat- l pelvic and abdominal wall. Because of a poorly eloped broad ligament on the right, the uterus, the ovary and the tube were pulled to the left. A rt mesovarium was present on the left. The rectum o had a short mesentery in its upper part. Aside m these variations the peritoneal reflections followed usual descriptions.

Genital Organs: The left ovary was of normal size d shape. The long axis of the ovary was directed rly vertically, and the uterine tube lay along its eral margin. The fimbriated extremity of the tube s directed superiorly; inferiorly the tube entered the ex" of the uterus. The uterus was of moderate e, 3.3 cm. long, 0.8 c . from side to side and 1.6 cm. nteroposteriorly. The fundus was peaked, and the ft uterine tube entered at this apex. The walls of he uterus in this twin were extremely thin. While here was no recognizable ovary or tube on the right ide in the pelvic region, an odd structure, previously escribed, was observed on the posterior abdominal wall fig. 13). On histologic examination it was found to e an ovary and a tube. Figure 16 shows this struc- ure dissected out. The long, thin portion at the upper art (fig. 16) was the uterine tube. The ovarian issue (fig. 16) extended from the widest part down o the bifurcation at the lower end of the structure. The right uterine tube gradually decreased in size as it approached the pelvis; it entered the right lateral side of the uterus about 1 cm. below the left tube. The vagina was fusiform when viewed from the front. The fornices were poorly developed.

Blood Vessels: The blood vessels conformed to the usual descriptions. There was a relatively large middle sacral artery that extended along the posterior pelvic wall to anastomose with a similar artery in the right twin.

Nerves: A detailed dissection of the nerves was not made; those encountered and dissected were normal.

STRUCTURES AT POINT OF FUSION

It is considered best to describe for the twins jointly those organs which lay at the point of fusion. Since this fusion was in the pelvic area the description will include the external genitalia and the spine.

External Genitalia: Figure 17 shows the region of the external genitalia. Apparently there were two distinct pubic eminences, located over the respective symphyses. Four rounded and distinct masses of tissue were present in the genital region and corresponded to the labia majora. The right labium of the right twin and the left labium of the left twin were in close relationship to the pudendal cleft and were larger than the other two labia. The left labium of the right twin and the right labium of the left twin lay at a distance

Figs. 15 to 18.—*15*, abdominal viscera after the peritoneum had been removed. Note the exposed ovary and be on the right side (*A*). *16*, organs of the genitourinary systems and the alimentary tracts of the two fants. *A* represents the anomalous right uterine tube and ovary which were present in the left twin. Note the nion of the two urinary bladders. *17*, external genitalia of the twins. Notice the difference in size of the bia majora. The clitoris was single, and there was a single pair of labia minora. The anal opening is beled *A*. *B* is an area of ulceration. *18*, external genitalia of the twins, showing the single vestibule. and *B* represent the urethral and vaginal orifices of the right and the left twin respectively. The anal pening is plugged with cotton.

of 1 cm. from the pudendal cleft. Here the distinct pairing of the organs seemed to end, and the remaining external structures were single.

For convenience in description, the terms above, upward, etc., will be applied to the position toward the top of the accompanying photographs. One pair of labia minora was located in the midline at the point of fusion. The long axis of the labia was roughly parallel to the plane of fusion. Each labium minus measured approximately 5 mm. in length and was placed along the anterior half at the side of the vestibule. There was a single clitoris, which was located beneath the anterior labial commissure, almost entirely hidden by the anteromedial ends of the labia minora. The preputium and the frenulum of the clitoris were well developed.

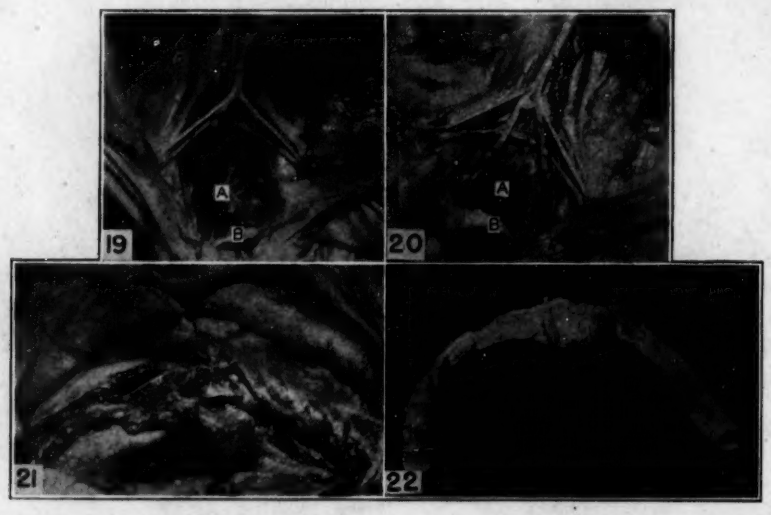
Below the clitoris was a semicircular-shaped vestibule, the base of which was directed toward the clitoris. This vestibule had a well defined and slightly raised median septum, on each side of which were two wedge-shaped orifices (fig. 18). The two upper orifices were about half as large as the lower ones and were the external urethral openings for the right and left twins. The two larger lower openings were the external vaginal orifices. Approximately 2 cm. below the lower boundary of the vestibule was a single anal opening (fig. 18). On closer examination a median septum, formed by the adjoining walls of the rectums of the two infants, was found just inside this opening.

During the course of the dissection of the pelvic organs a heavy fibrous cord (5 cm. long) was encountered, which crossed the pelvic cavity at the plane of fusion (figs. 19 *B* and 20 *B*). Its diameter, approximitely 6 mm. at the origin, decreased rapidly. The cord extended deep to the pelvic organs and was attached to the posterior lateral anal wall. Histologic examination showed it to be muscle, fascia and vessels. The rest of the plane of fusion was filled with a thin fascia.

Spine. — Examination of the twins from the back showed a leaking meningocele with accompanying spina bifida. The spina bifida involved the sacral areas: the entire sacrum of the right twin and about half of the sacrum of the left twin. The coccyx was common to both infants. The ilia were not fused. The posterior superior spines of the ilia were approximately 4.6 cm. apart. The posterior superior spine was 2.7 cm. from the midpoint of the coccyx in both twins. A large meningocele was present and was contributed to by each twin. The meningocele was directed posteriorly and superiorly (fig. 21). A laminectomy of the lumbar vertebrae was performed, and the meningocele and a section of the cord was removed from each twin. The cord had been reduced to a hollow tubular structure, with thin walls about 1 mm. thick (fig. 22).

When the surface of the skin was cut to separate the twins, a heavy fascial layer was encountered. This layer extended between the two infants, and a separation of the two buttock regions could be made by blunt dissection. The only structures encountered bridging the area were a very few nerve fibers. On the inside of the pelvis the two peritoneal cavities were separated from each other by a vertical fascial septum. In this septum the heavy fibrous cord, previously described, was embedded.

This completed the gross dissection study. Further data on histologic observations, handprints and footprints were collected.



Figs. 19 to 22.—The pelvic cavities of the right (*19*) and left (*20*) twins have been photographed to show *A*, the middle sacral artery of each twin (these arteries anastomose at the point of fusion of the twins); *B*, the heavy connective tissue cord that was embedded in the fascial septum which separated the peritoneal cavities of the twins. *21*, posterior view at the point of union of the twins. A laminectomy was done to expose the meningocele and cords. *22*, cords with the common meningocele. Note the extremely thin walls of both cords. The cord of the right twin is on the left side of the photograph.

COMMENT

The occurrence of pathologic specimens among human embryos is not as infrequent as one might think from the number of abnormalities and monstrosities seen at birth. F. P. Mall,[1] in examining 1,001 specimen embryos and ova, found nearly 40 per cent of them pathologic. Usually, however, since most of the abnormalities are not compatible with growth and develop-

1. Mall, F. P.: On the Frequency of Localized Anomalies in Human Embryos and Infants at Birth, Am. J. Anat. **22**:49 (July) 1917.

ent, the embryos are aborted early in pregncy. Mall found only 5 monsters carried to rm among 1,001 specimens examined.

Reports on Pygopagus Human Twins.—A mber of pygopagus twins have been deribed in the literature, but unfortunately no scriptions of complete dissections are availle. They have been described more as curiosis or in consequence of a wish to record briefly superficial anomalies and psychologic findings an with the object of giving an embryologic terpretation. In this discussion mention will made of only the better known pygopagus ins. The Blazek twins were described by r John Bland-Sutton [2] and Benjamin H. reakstone.[3] These twin girls, of Bohemian igin, were joined by their sacra and were uble except for the genitalia and the anus. he vulva was single but received two urethras om separate bladders. They lived to be adults, d Rosa gave birth to a male child.

Another case of conjoined twins of this type Simplicio and Lucio Godena) was reported by uis Sullivan.[4] These twins were boys, aged years at the time Sullivan examined them. hey were born on the island of Samar, Phillipne Islands, of mixed Malay stock. They were nsidered to be identical twins and were joined the buttocks. While the rectum was common the twins, the genital organs were normal.

The Hilton twins, examined and reported by ewman,[5] were joined in the same manner as e Blazek twins. The Hilton twins were girls. everal pygopagus twins were mentioned by ewman, but no details were given.

Theories of Causation.—It is generally conded that the production of monsters is not due rectly to germinal or hereditary causes but obably results from factors which affect or sturb the usual pattern of the development normal ova.

Various experiments have been carried out on e lower animals whereby monsters were oduced by certain environmental changes. tockard [6] suggested that a change in the supply of oxygen was probably the most likely factor, particularly in the placentate group. This change, occurring at a crucial period in the development of the embryo, would arrest the normal pattern of development and might account for the double gastrulation or blastapore formation, resulting in the formation of two axes instead of the usual one. Stockard has also been able to produce double monsters in fish by lowering the temperature at a critical period. In cases of placentate groups the possibility of extreme changes in temperature must be ruled out. It has been possible experimentally (Wilson,[7] Loeb [8] and others) to separate the two primary blastomeres with resulting formation of twins. Spemann [9] was able to produce double monsters by partial constriction of the egg during later stages of blastula or gastrula. Wilson [10] and Conklin [11] found, however, that not all species produce complete twins when the blastomeres are separated.

It is hard to conceive of factors capable of producing comparable separations, either complete or partial, in an environment as protected as that in the uterus. Nevertheless, Wilder's [12] "blastotomy theory" of the formation of double monsters was based on this concept. Newman [13] expressed the opinion that twinning is due to fission of a single embryonic axis followed by a secondary partial fusion. Witschi [14] recognized overripeness of the egg as a causative factor in the production of identical and conjoined twins. Overripe eggs are no longer capable of the normal axiate organization. Instead it often happens that two or more secondary points of gastrulation and two or more embryonic axes result. In placentate animals this condition seems more plausible as a causative factor than some of the previously mentioned environmental

2. Bland-Sutton, J.: Rosa-Josepha Blazek: The ohemian Twins, Lancet **1**:772 (April 15) 1922.

3. Breakstone, B. H.: The Last Illness of the lazek (Grown-Together) Twins, Am. Med. **28**:221 April) 1922.

4. Sullivan, L.: The "Samar" Twins, Am. J. Phys. nthropol. **2**:21 (Jan.) 1919.

5. Newman, H. H.: Differences Between Conined Twins in Relation to a General Theory of Twinng, J. Hered. **22**:201 (July) 1931.

6. Stockard, C. R.: Developmental Rate and Strucral Expression: An Experimental Study of Twins, ouble Monsters and Single Deformities, and the Interction Among Embryonic Organs During Their Origin nd Development, Am. J. Anat. **28**:115 (Nov.) 1921.

7. Wilson, E. B.: Amphioxus, and the Mosaic Theory of Development, J. Morphol. **8**:579 (Aug.) 1893.

8. Loeb, J.: Beiträge zur Entwickelungsmechanik der aus einem Ei enstehenden Doppelbildungen, Arch. f. Entwcklngsmechn. d. Organ. **1**:453, 1895.

9. Spemann, H.: Entwickelungspsysiologische Studien am Triton-Ei: I. Arch. f. Entwcklngsmechn. d. Organ. **12**:224, 1901; II, ibid. **15**:448, 1902; III, ibid. **16**:551, 1903.

10. Wilson, E. B.: Experimental Studies on Germinal Localization: I. The Germ-Regions in the Egg of Dentalium, J. Exper. Zoöl. **1**:1 (May) 1904.

11. Conklin, E. G.: Mosaic Development in Ascidian Egg, J. Exper. Zoöl. **2**:145 (May) 1905.

12. Wilder, H. H.: Duplicate Twins and Double Monsters, Am. J. Anat. **3**:387 (Sept.) 1904.

13. Newman, H. H.: Twin and Triplet Chick Embryos, J. Hered. **31**:371 (Sept.) 1940.

14. Witschi, E.: Appearance of Accessory "Organizers" in Overripe Eggs of the Frog, Proc. Soc. Exper. Biol. & Med. **31**:419 (Jan.) 1934.

agents. The tendency to retain the ovum until it is overripe is possibly based on endocrine factors, which may or may not be of hereditary type.

In regard to the condition producing twinning and conjoined twins in human beings the theory advanced by Witschi seems to explain most adequately the conditions found. If retention of the egg within the follicle for a longer period than usual is assumed, the power of the egg to differentiate normally would gradually decline. When the egg is finally expelled and fertilized, instead of a single primitive streak there now develop two. In the case of pygopagus twins they are located at some distance apart, so that each begins to develop independently. Apparently the axes of the embryos are not parallel but converge caudally. Consequently, during the later course of the formation of the embryos the two neighboring sides meet and partially fuse.

Probable Embryonic Development of the S. Twins.—The peculiarities occurring in the genitourinary organs of the S. twins indicate that during development paired pronephric and mesonephric primordia were present in each twin. This is concluded from the presence of four essentially normal ovaries. The first peculiarity is encountered in the derivatives of the metanephric blastema cords. As was previous mentioned, there was a metanephros for the ri side of the right twin and one for the left s of the left twin. But evidently the adjace metanephric primordia for the left side of t right twin and the right side of the left tw must have been fused into a common midli mass. With growth and folding of the walls the body, most of this single metanephros mu have become included in the body of the rig twin. The presence of the partial ureter in t left twin is not in disagreement with this inte pretation, since embryologically it is a derivati of the mesonephric duct.

In conclusion, the anatomic peculiarities the S. twins indicate that the adjoining nephr genic blastema cords fused at about the level the twenty-eighth somite and the spinal tub at about the thirty-second somite. In oth words, fusion of the separately started embry occurred during the fourth postovulatory we of development.

Members of the department of Pediatrics of t State University of Iowa were primarily responsi for making the twins available to me for study. Ca tain C. B. Hall, who delivered the twins, provid information concerning the placenta and the deliver Dr. R. J. Terry gave criticisms and suggestions the anatomic portion of the paper, and Dr. Er Witschi gave suggestions and aid in interpreting t embryologic material.

ANOMALY OF THE PERIPHERAL VESSELS IN A NEWBORN INFANT

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The present paper reports a microscopic omaly in the peripheral vascular system of an nt in conjunction with a death anatomically ributed to multiple small focal hemorrhages in ociation with formation of abscesses. A re- w of the literature fails to reveal any report of ons resembling those about to be described.

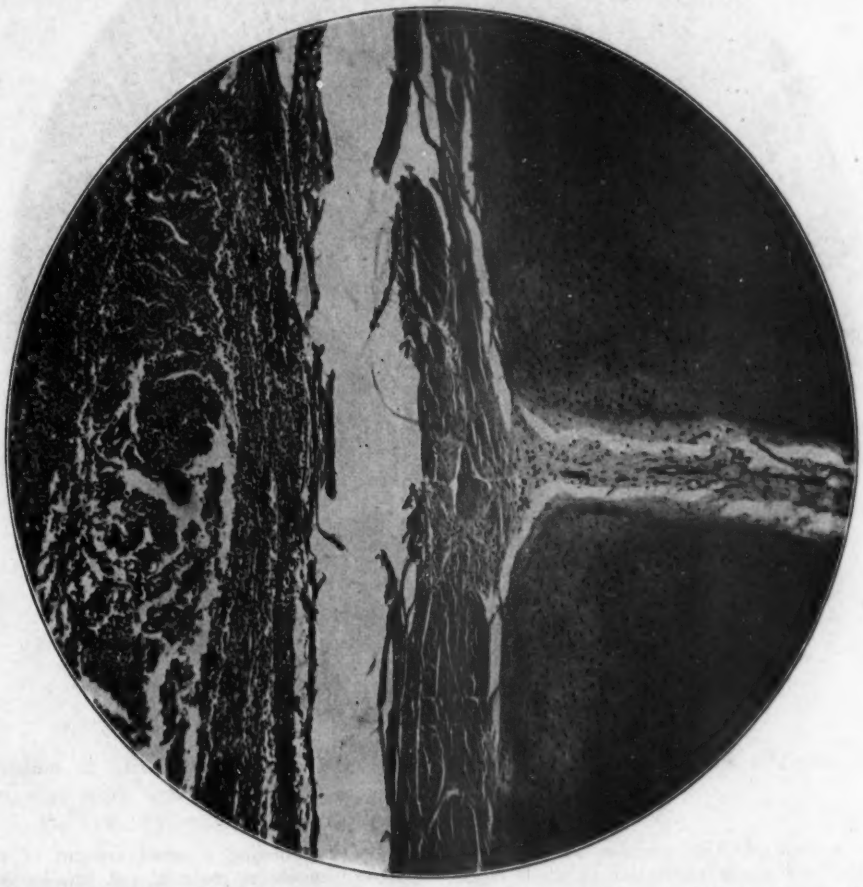

Fig. 1.—Hematoxylin and eosin stain; × 70. Hemorrhages and formation of abscesses in muscle and connec- e tissue adjacent to costal cartilage.

REPORT OF A CASE

A two week old white boy was admitted to the chil- n's division of the hospital on June 26, 1944 because of vomiting of one week's duration. The infant, born at full term, had been delivered by forceps and at birth weighed 6 pounds, 13 ounces (3,090 Gm.). He was a first child. The parents were living and well, and no history of familial disease was elicited.

Physical Examination.—Physical examination revealed a poorly nourished infant weighing 5 pounds 14 ounces (2,665 Gm.) and appearing neither acutely ill nor dehydrated. A peanut-sized tumor mass was palpable in the right upper quadrant of the abdomen. There were no other positive findings. The patient's temperature on his admission to the hospital was 98.4 F.

Course.—Observation during the next forty-eight hours demonstrated the vomiting to be projectile. Few of the feedings were retained. A clinical impression of hypertrophic pyloric stenosis was confirmed by roentgenographic studies made after administration of barium sulfate. Two days after the patient's admission a Ramstedt operation was performed, an incision being

From the Achelis Laboratories and the Abraham obi Division for Children of the Lenox Hill Hospital. Dr. Jerome S. Leopold gave permission to investigate s case. Drs. George L. Rohdenburg and Rudolf M. ltauf gave stimulating and constructive criticism in e study of the material.

made in the right upper quadrant. The peritoneum was closed with continuous plain catgut, the fascia with interrupted chromic catgut and the skin with interrupted silk sutures.

For the following forty-eight hours the infant continued to do poorly and vomited persistently. On the second postoperative day the operative site was exposed and a dehiscence of the wound with evisceration of a loop of small bowel identified. Under general anesthesia the wound was closed with through and through interrupted braided silk sutures.

After this procedure the infant continued to do poorly. Nutrition per os was inadequate, and daily infusions of plasma and of sodium chloride solution were administered in addition to a single transfusion of whole blood.

On the third postoperative day after closure of the disrupted wound a brawny, generalized edema was recorded, and this was more conspicuous on the following day. At this time the urine showed an occasional leukocyte and red cell. An analysis of the blood showed hemoglobin 14.2 Gm. per hundred cubic centimeters (95 per cent), red blood cells 4,900,000 and white blood cells 4,800, with 41 (8) per cent neutrophils (33 per cent mature and 8 per cent immature), 57 per cent lymphocytes and 2 per cent eosinophils. A temperature range of 96 to 102 F. was noted during this period.

The steady downhill course continued, and on the tenth day after admission to the hospital (the sixth day after the second operative procedure), while being fed, the infant grew cyanotic, coughed up a small amount of blood and suddenly died. The clinical impression that the cause of death was sclerema.

Autopsy.—Gross Examination: A postmortem examination performed the day of death revealed the following data: The body was poorly developed and poorly nourished. There was a partly healed upper right tus incision. The skin showed no alterations on g examination. At several of the distal interphalan joints of the fingers and the toes there were slig elevated purplish red areas about 0.5 cm. in diam In the soft tissue and the muscle overlying the c cartilages near the sternal margin were purplish areas revealing on cross section circumscribed he

Fig. 2.—Hematoxylin and eosin stain; ×70. Hemorrhage and obliterative arteritis in muscle over co cartilage.

rhages surrounding a small amount of turbid bro purulent-appearing material. A few loops of small testine were loosely united by thin, easily separated hesions; the peritoneal surfaces were otherwise smo and glistening throughout. A 2 cm. longitudinal sur cal incision was present on the anterior part of pylorus, and this extended completely through muscularis, the cut margins of which were bulgi there was no fibrin reaction and no scar formation. lungs showed extensive collapse posteriorly. Exami tion of the remaining parenchymatous organs and of gastrointestinal tract revealed no gross abnormaliti

Microscopic Examination: Microscopic histolo examination demonstrated the following data: Secti through the lungs revealed focal and diffuse interstiti intra-alveolar, and subpleural extravasations of blo Patchy areas of atelectasis were present. The ves

eared to be normal. In the myocardium there was
d a single abscess consisting of a central necrotic
e rich in polymorphonuclear leukocytes, and this was
rounded by a thin, fibrous stroma infiltrated with
ll round cells and polymorphonuclear leukocytes. In
liver there was diffuse sinusoidal congestion; the
els were not remarkable. The fibrous elements of
spleen were increased in number; the vessels were
mal. Sections through the pylorus demonstrated the
cosa to be intact. The muscularis was markedly
kened, the margins of the surgical incision were
l outlined and there was no inflammatory response or
mpt at fibroblastic bridging of the defect; in the
osa a few large wandering cells were seen. In the
al cortex the glomerular tufts were delicate. The

ations, and many of the arterioles here showed varying degrees of obliterative arteritis, from adventitial thickening and chronic inflammatory infiltration of cells to intimal proliferation and fibrous occlusion (fig. 2). Finally, in the loose connective tissue overlying the intact bundles of muscles there were several of the discrete, compact, endothelioid-like masses of cells so conspicuous in the skin.

Study of the skin demonstrated the squamous epithelium to be thinned out and the rete pegs short and inconspicuous; beneath were the usual appendages of the skin. The stroma of the corium was much thickened, sclerosed and hyalinized and supported in its depths many elongated finger-like retractile cords composed of closely packed cells supported by a thin capillary stroma

Fig. 3.—Mallory stain; × 70. Demonstration of the endothelioid-like cell masses in the deep layers of the skin. so present in the connective tissue of the costal cartilage region and in the serosal fat adjacent to the pancreas.

lial arteries were congested, and in the medulla there
re small and large extravasations of blood in the
oma and into the tubules. A small abscess composed
central necrotic debris and small round cells sur-
nded by a zone of hemorrhage was present in the
dulla.

Sections through the costal cartilage demonstrated
t the muscular bundles on each side of the cartilage
te were frayed and disrupted or were necrotized and
ltrated with inflammatory cells, in which polymor-
nuclear leukocytes were present in abundance (fig.
The regions of necrosis and infiltration were irregu-
, in some instances extending into the underlying
tilage, which here was rarefied, necrotic or fibrosed.
morrhagic extravasation was uniformly present in or
r the zones corresponding to these destructive alter-

(fig. 3). These cells were generally large and oval except when lining the numerous discrete blood channels, when they were elongated and resembled typical vascular endothelium; the nuclei were vesicular and occasionally elongated, and their cytoplasm was pale-staining, granular and sometimes vacuolated. No mitoses were seen, and the cords of the cells exhibited no infiltrative tendencies. The numerous small capillary channels usually contained red blood cells and generally had a diameter capable of accommodating one or two red cells. Occasionally, here and in the other regions of the body in which these structures were found the blood spaces in the cords were tortuous and dilated and did not contain blood elements. Lesions similar to those in the deep corium of the skin were present in the peripancreatic connective tissue.

COMMENT

The pathologic picture of the skin is not that of sclerema or of allied diseases.[1] Fat degeneration, trabecular thickening, needle-like crystal spaces and rosettes and granulomatous proliferation with epithelioid and giant cells were absent here. The most conspicuous feature in this case was the presence in the connective tissue of the skin and in the loose connective tissue elsewhere of peculiar discrete circumscribed processes of endothelioid-like cells channeled by multiple small and uniform capillaries. The appearance of these structures suggests that they represented embryonic vascular rests undergoing much delayed development or maturation toward formed blood channels.

Recalling the embryology of the vascular system,[2] one notes that the primordia of the blood vessels make their appearance extremely early in the development of the embryo. In the 24 hour old blastoderm (five segments) the area vasculosa is well outlined at the border of the vesicle. It has been demonstrated conclusively that blood vessels in the embryo have their origin in situ from the primitive mesenchymal cells, which by coalescence form blood islands. The cells of the islands become variously compressed and vacuolated to form primitive angioblastic primordia lined by young endothelium. This process occurs throughout the entire blastoderm. Shortly these independently patterned channels fuse to form intact blood vessels. It is not until considerably later, after the circulation begins, that new vessels may arise by sprouting from pre existing blood channels.

From an analysis of the striking patholog changes in this infant it is difficult to find the cause and to establish interrelationships. Stud of the material indicates that the cause of deat was a systemic vascular insult with hemorrhag extravasation and secondary formation of ab scesses in various regions and organs of th body, including the costal pericartilaginous tis sues, the lungs, the kidneys and even the myo cardium. Ordinarily one might assume these t be manifestations of a pyemic or an emboli phenomenon. However, there were no signs o generalized or local peritonitis, and no other fo cus of infection was demonstrable clinically or o postmortem examination. One cannot escap the fact that the multiple lesions of hemorrhag and necrosis with abscess formation in this ca are concurrent findings with the peculiar va cular tufts composed of endothelioid-like cell The latter structures were found in the deepe part of the corium, in the soft connective tissu of the region of the costal cartilage and in th serosal fat overlying the pancreas. One ma conjecture as to the possible relationship o the common derivation of these two distinc lesions. Perhaps the entire situation represen a generalized arrested and/or delayed develop ment of the peripheral vascular system, with th hemorrhagic phenomena a manifestation of th fragility of anatomically immature or poorly de veloped walls of small vessels.

CONCLUSION

A hitherto undescribed anomaly of the peripl eral vascular tree was observed in a newbor infant, who died.

In reviewing the pathologic features of th case the relationship of the two vascular lesion the one proliferative and presumably embryon and the other destructive, is obscure.

Consideration of the embryologic aspects le to a hypothesis of embryonal maldevelopment o the peripheral vascular tree.

Lenox Hill Hospital.

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HAIR LACQUER DERMATITIS IN INFANTS FROM CONTACT WITH MOTHER'S HAIR

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BROOKLYN

Dermatitis caused by hair lacquer has by now come recognized as a well defined clinical tity. The condition has been described mostly women who use the lacquer to keep hair in ace, a matter of some difficulty in the case of e present fashionable "upswept hair-do." Some stances have been reported in young children,[1] whom the lacquer was used presumably for e same function, as a hair dressing. This communication reports 2 cases in which infants of ss than a year were affected. Since the lacquer as not applied directly to the victims' hair, the agnosis was considerably more difficult than in e usual case of this disorder.

The pathogenesis of this dermatitis has been udied in detail by Schwartz.[2] Hair lacquer in se before the war contained shellac, which ems to have produced dermal reactions very ldom. Since then, synthetic resins, combinaons of rosin and maleic anhydride, have been bstituted for the unobtainable shellac. The irect action of the chemical has been enhanced y the extremely high or extremely low p_H of the nished commercial product.

REPORT OF CASES

CASE 1.—A white girl 10 months old was seen cidentally to the examination of her mother for a rdiac condition. The mother complained bitterly that e had treated the child for "eczema" of the face since e age of 2 months without success. Local therapy, changes in diet, allergy tests of all sorts had been tried to no avail.

Examination of the infant revealed a dermatitis of the inner sides of both forearms, especially the right. The external aspects of the arms and forearms were less involved. The right side of the neck, both cheeks and part of the forehead were involved. No unexposed portions of the body were affected. The lesions were red, swollen, poorly defined and somewhat crusted and vesiculated. The child seemed distressed by the skin condition and cried a great deal.

When the mother picked up the child, it was observed that the child's skin was brought into close contact with the mother's lacquered hair. The first published reports of dermatitis due to lacquer had just appeared, and the possibility that the infant might have this condition suggested itself. The material in the lacquer pad used by the mother was employed in a patch test, which elicited a strongly positive reaction. The dermatitis subsided quickly when the mother discontinued the use of lacquer. The condition disappeared within a week and has never returned.

CASE 2.—A boy 6 months old was brought for cardiac examination because the family physician had found a murmur.

Examination revealed a congenital cardiac lesion, probably a patent interventricular septum. There was a crusty, erythematous dermatitis involving the forearms, one cheek, most of the forehead and temples and the back of the neck. This condition had not responded to changes in diet or to medication prescribed by the pediatrician and a consulting dermatologist.

In the light of my experience with the first patient, the possibility of a similar pathogenesis was considered at once. A patch test with the mother's hair lacquer was strongly positive. In this case, too, the eruption disappeared as soon as the mother adopted another hair dressing.

SUMMARY

In 2 infants dermatitis was caused by hair lacquer used by the mother.

In each case the possibility of this dermatitis had not been considered because lacquer had not been applied directly to the infant's hair.

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From the Cardiac Clinic, Bushwick Hospital, Brooklyn, N. Y.

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Abstracts from Current Literature

Metabolism; Infant Feeding Milk and Other Foods

STUDIES OF THE NUTRITIONAL STATE OF CHILDREN IN UNOCCUPIED FRANCE IN THE FALL OF 1942. HAROLD C. STUART, J. Pediat. **25**:257 (Sept.) 1944.

Studies of the nutritional state of children were organized by the American Red Cross in connection with its program for distribution of milk in unoccupied France and were carried out at the medical schools of Lyon, Clermont-Ferrand and Montpellier, at the Institut de Recherches d'Hygiène in Marseille and at a state hospital in Monaco. The same examination was carried out at each center on a group of 80 to 100 children, who were then to receive from the American Red Cross a supplement of milk at school. It was planned that the examination should be repeated on the same children at four month intervals during the period of supplemented feeding. The children selected were between 10½ and 11½ years of age and were attending schools which were considered to be most representative of general conditions in their communities. An American Red Cross record form was prepared, which required only checking of code numbers to indicate the evaluation of observations made at examinations. The latter included items from clinical examinations, body measurements and study of roentgenograms and blood samples.

The data reported in this article were obtained from records and roentgenograms of 134 children, especially of 35 girls and 53 boys in the 11 year age group, in Marseille, which the writer had an opportunity to study while in detention in France, prior to being taken to Germany for internment. The laboratory determinations were not available at this time, and the numbers of children studied were not sufficient to justify tabulation of the clinical findings; so the report deals principally with body measurements obtained from roentgenograms and evaluation of the latter from the standpoint of osseous development and of nutritional state. Tables are included which give mean values for all the measurements and the deviations of these from American norms. The body measurements used were weight, height, chest circumference and pelvic breadth. The measurements taken from an anterior-posterior view of the leg area were length of tibia, breadth of calf, breadth of tibia, breadth of muscle and breadth of skin and subcutaneous tissue.

Except for breadth of pelvis of girls, the mean values for all measurements of the children in Marseille were smaller than for the American children chosen for comparison. Body weight was considerably less than would be expected normally after making corrections for size and build. As indicated by the roentgen measurements, this was due both to lack of skin and subcutaneous tissue and to slight muscular development. A comparison of these results with the results of similar studies in Marseille eighteen months earlier failed to demonstrate any greater deficit in the averages for measurements of soft tissues, despite continued underfeeding. In both periods 6 year old children were found to be more nearly up to American standards in these measurements than were 10 or 11 year old children. No roentgenographic evidences of active rickets or of scurvy were found, but a few roentgenograms showed faulty mineralization.

When these roentgenographic measurements compared with the norms, given in the *Atlas of Sk Maturation* presented by Todd, both the boys an girls in this French series were found to be o average approximately one year behind expectan osseous development, as was the case with the chi studied early in 1941 in Marseille. A figure is pre giving the deviations from the norms in mean ana ages for all measurements studied and for both This shows that the French children, according to of these criteria, were between one and one and half years behind the American children with they were compared.

The article closes with a general review of nutritional situation in unoccupied France at the of 1942. The evidence appears to be that infants young children have not suffered as much as ones and that those over 12 years old especially been showing evidences of a general type of u nutrition in ever increasing numbers. By this meant lack of weight, failure to gain and grow norm lack of vigor and ready fatigue, mild anemia inadequate storage of vitamins in the blood. T findings would be expected on the bases of di surveys, which indicate low total calories, low of total protein and especially of animal protein, level of calcium and lack of certain vitamins. T had, however, been little increase of outspoken defici diseases, and it did not appear that in any consider percentage of children at any age health had profoundly affected, life endangered or development than moderately retarded. Under these circumsta it was felt that the supplement of 259 Gm. of which the American Red Cross was then abou distribute to the children from 10 to 14 years of would be ideally suited to retard if not to pre further deterioration of their nutritional state.

STUART, Bosto

THE PROTECTIVE DIET. RUTH PYBUS, Edinburgh J. **51**:21 (Jan.) 1944.

The author, who is sister dietitian at the R Infirmary, emphasizes the need for a protective especially for school children. A common problem the home is an adequate supply of vitamin C; amount furnished at home often needs to be sup mented by approximately 40 mg. at the school lunch Pills or capsules of ascorbic acid contain only the min and therefore are not to be compared with g vegetables. When citrus fruits are not available, spring cabbage is used; the latter is twice as po though not so well liked. Vegetables are useful and also when correctly cooked if not kept hot long. The content of vegetable broth is somew variable. The author gives the following figures vitamin C in vegetables:

Vegetable broth
.....10 to 15 mg. in ⅓ pint (20 cc.
Cooked new potato (not mashed)
.....25 mg. in 5 ounces (142 G
Lightly cooked cabbage
.....16 mg. in 3½ ounces (99 Gm.
Watercress
.....5 mg. in ⅓ ounce (9 Gm.

ato and other raw salads may well be alternated, with citrus fruits. The need for calcium is met ilk given both at home and at school. For young ren vitamins A and B will be provided by the use d liver oil, dried egg and milk; older children will atty fish, the amount of vitamin A being augmented rrots, green vegetables and liver.

rsery schools can be of teaching value to promote feeding habits. Children enjoy their foods much if they have had an adequate mixed diet since life.

NEFF, Kansas City.

BANANA (MUSA PARADISIACI OF LINNAEUS) IN NFANTILE FEEDING. MERCEDES CHÁVES ARANGO, ol. Soc. cubana de pediat. **15**:253 (May) 1943.

e author divides her work into three parts: (1) rical notes; (2) botanical considerations, and (3) ssion of the use of bananas and banana powder e diet of Cuban children, both normal and sick.

e cites experiments on rats fed with banana to deter- the vitamin B_1 content and the p_H of feces, the er of colonies in agar cultures of feces, etc. Be- e of its pleasant flavor, its richness in carbohydrates, ins and minerals and its high caloric value, she es its use in the diet of normal infants and children especially in the treatment of marasmus and celiac se.

KEITH, Rochester, Minn.

PLANTAIN (BANANA) (MUSA PARADISIACA OF INNAEUS) IN INFANT FEEDING. L. E. C. FONSECA, ol. Soc. cubana de pediat. **15**:343 (June) 1943.

is article discusses the use of the plantain, a banana monly used in Cuba. The varieties of the banana are tioned, and their chemical compositions, both when n and when ripe, are outlined. The banana powder is described. The use of banana is recommended in treatment of infant diarrhea, bacillary dysentery, oid and celiac disease, as well as in the feeding of nal infants. Twenty-six illustrative cases are out- d.

KEITH, Rochester, Minn.

COW'S MILK IN THE NOURISHMENT OF THE CHILD: TS ADVANTAGES AND DISADVANTAGES. FÉLIX BURÉS OLINA, Bol. Soc. cubana de pediat. **15**:372 (June) 943.

is is a discussion of the use of cow's milk in infant ing. The details of the composition, the grading the handling of the milk are given, with considerable ssion of the bacterial content.

KEITH, Rochester, Minn.

RITIONAL UTILIZATION OF THE OIL OF CHESTNUTS ROM PARÁ. M. L. DE OLIVA COSTA, Horo méd., Rio de Janeiro **1**:31 (Feb.) 1943.

fter previous studies done by Dr. Dante Costa and co-workers in the laboratory, the author performed eriments in cooking with Brazil nut oil as a sub- te for fats, olive oil and other vegetable oils, fats monly employed in human food.

he experiments consisted in the preparation of ral dishes used in Brazil, such as beefsteaks, eggs, rice and beans, fried or cooked with the oil obtained n Brazil nuts, with absolutely satisfactory results o taste and good appearance of the food. Brazil oil was successful too in the preparation of salads.

Under present wartime conditions the utilization of Brazil nut oil in the preparation of food will help solve the problem of the shortage of edible fats.

The oil will be obtained by compression, giving incidentally another product, partially defatted Brazil nut flour, a useful protein food already studied and proposed by Dante Costa and S. Mota.

It should be possible to produce the Brazil nut oil at a low cost.

AUTHOR'S SUMMARY.

PROBLEMS OF NUTRITION AND DIETARY REQUIREMENTS IN CHINA. J. HENG LIU and C. K. CHU, Chinese M. J. **61**:95 (April-June) 1943.

Beriberi is regarded as the most prevalent of the deficiency diseases in China. Xerophthalmia and keratomalacia are not at all rare; this is also true of such deficiency diseases as rickets, tetany and scurvy, though these may be so mild that the patients do not come to the physician. Because of the prolonged deficiency in protein feeding due to the war, nutritional edema is on the increase.

The authors state that preschool children and infants should be divided into two age groups. They give five tables of suggested foods, four of which are planned for infants, preschool children, school children and youths respectively. For each group the number of grams of foodstuffs in general and of calcium and protein and the calories furnished by each food are enumerated. As would be expected, youths are supplied somewhat more abundantly than adults. Infants under 6 months of age are excluded from this study because in China all mothers are expected to nurse infants of this age.

A great problem in China, even after the war, will be the danger arising from widespread use of milk, since it is so perishable a commodity in that country. The attempt will be made to get along without fresh milk and other fresh dairy products and to produce powdered milk in quantity for supplying the food elements needed by growing infants and children.

NEFF, Kansas City.

Vitamins; Avitaminoses

ON THE ISOLATION AND PROPERTIES OF THE FLUORESCENT FACTOR F_2 FROM HUMAN URINE. VICTOR A. NAJJAR, VIRGINIA WHITE and DWIGHT B. MCNAIR SCOTT, Bull. Johns Hopkins Hosp. **74**:378 (June) 1944.

When the body is adequately supplied with nicotinic acid a highly fluorescent compound, F_2, apparently derived from a precursor, can be obtained from the urine by appropriate treatment. The identity of the precursor has not been established. The substance F_2 appears to be a butyl ether of N-methyl nicotinamide alphacarbinol.

LYTTLE, Los Angeles.

THE LABORATORY DIAGNOSIS OF NICOTINIC ACID DEFICIENCY: AN IMPROVED PROCEDURE FOR THE DETERMINATION OF F_2 (N-METHYL NICOTINAMIDE DERIVATIVE) IN URINE. VICTOR A. NAJJAR, Bull. Johns Hopkins Hosp. **74**:392 (June) 1944.

A modification of the original Najjar-Wood procedure for the estimation of the fluorescent factor, F_2, is described.

In adults with an oral load of 100 mg. of nicotinamide an excretion of less than 2,100 micrograms of N-methyl nicotinamide chloride in four hours may be significant of depletion.

LYTTLE, Los Angeles.

A Case of Pellagra Developing on a Hospital Ward in a Patient Receiving Vitamin B Complex. Dean W. Roberts and Victor A. Najjar, Bull. Johns Hopkins Hosp. **74**:400 (June) 1944.

Pellagra developed in a 12 year old girl who was under observation in the hospital and was receiving a preparation of vitamin B complex at the time.

It is pointed out that certain commercial yeast extracts do not supply sufficient quantities of nicotinic acid.

Authors' Summary.

The Anti-Black Tongue Activity of N-Methyl-Nicotinamide Chloride. Victor A. Najjar, Margaret M. Hammond, Mary Allen English, Maria B. Wooden and Carolyn C. Deal, Bull. Johns Hopkins Hosp. **74**:406 (June) 1944.

N-methylnicotinamide chloride has been shown to be effective in preventing as well as curing black tongue in dogs. Its possible value in human pellagra is suggested. The suggestion is advanced that the F_2 nucleus (N-methyl pyridine B-carboxy-) may be the active antipellagra vitamin.

Authors' Summary.

Congenital and Infantile Beriberi. David W. Van Gelder and Frances U. Darby, J. Pediat. **25**:226 (Sept.) 1944.

A brief review of the literature on states of thiamine deficiency in infants is presented. The infantile form of beriberi usually develops when infants are 2 to 3 months of age; the vast majority of babies affected are breast fed. The manifestations in infants are protean: There may be anorexia, abdominal distention or tenderness, vomiting, oliguria, edema, cardiac enlargement, dyspnea, cyanosis, aphonia and even convulsions. The response to administration of thiamine hydrochloride is often extremely rapid.

A case of congenital beriberi is reported. The mother exhibited slight edema during the last trimester of her pregnancy. Because of edema her intake of fluids was limited, but in addition she voluntarily limited her diet mainly to fruits. The infant was born cyanotic and dyspneic and became almost aphonic. The heart rate was extremely rapid, and a roentgenogram of the chest showed a heart which occupied over 75 per cent of the thoracic cavity. A spectacular clinical improvement, with marked reduction in the size of the heart followed the use of large doses of thiamine hydrochloride (150 mg. daily) administered parenterally. An electrocardiogram taken early during the illness showed deviation of the axis to the right and low voltage in all leads. A subsequent electrocardiogram, after adequate treatment with thiamine hydrochloride, was normal.

Assays of the thiamine in the urine and determinations of the levels of dextrose, pyruvate and lactate in the blood, both fasting and following the ingestion of dextrose, were done on the mother after she had been restricted for a period to her antepartum diet. These tests were then repeated after a period during which she received an adequate diet. All these tests were indicative of a state of thiamine deficiency in the mother during the period of dietary restriction.

It is considered that in some instances congenital idiopathic cardiac hypertrophy or status thymicolymphaticus may actually be unrecognized congenital or infantile beriberi. Infants with large hearts in whom no valvular or congenital lesion can be demonstrated should be given large parenteral doses of thiamine hydrochloride as a therapeutic test.

Pregnant or lactating mothers should be provided with an adequate intake of vitamin B. If the maternal diet is suboptimal, nursing infants should receive additional vitamin B.

Van Gelder, Baton Rouge, La.

Vitamins and the Eye, Ear, Nose and Throat: A Review of Recent Literature. Isaac H. Jones, Harold S. Muckleston, Eugene R. Lewis, Walter P. Covell and Leland G. Hunnicutt, Laryngoscope **53**:767 (Dec.) 1943.

Some astonishing cures have been attributed to vitamins in the past. The recent literature chiefly concerns scientific work and gives few clinical results of the therapeutic use of vitamins, particularly in regard to diseases of the eyes, the ears, the nose and the throat.

One recent advance is that concerning vitamin A and color blindness. At first the problem seemed a simple one, but later complexities occurred. Some results were confusing and contradictory, and other work indicated that vitamins B_2, D and C were also related to the condition.

Under the heading "Vitamins in General" the authors discuss the vitamin contents of foods and note that there is great variance in the vitamin content of a given food, depending on its preparation, cooking, soil and other factors. The authors mention the valuable contributions of Price and Rosenberg to the subject of the vitamins. They discuss the relation of vitamins K and C to hemorrhage. The relation of vitamins to infection of the upper respiratory tract was studied by Cowan, Diehl and Baker. They concluded that in persons with an adequate diet the addition of any of the vitamins had no effect on the incidence or the severity of infections of the upper respiratory tract. The opposite is also true; that is, the lack of almost any of the vitamins, or of the other food elements essential for nutrition, will result in lowered resistance to infection. Likewise, vitamin A is closely associated with the health of the mucous membranes. Deficiency in this vitamin must be guarded against. Infection itself increases the need for vitamins. An adequate supply should be maintained during all infections.

The authors discuss the various vitamins in detail. In regard to vitamin B_1 they note that the upper limit of intake for safety is seldom reached in American diets. The development and the health of the teeth are influenced by the B complex, vitamin D and vitamin C. Palmer found that vitamin B_1 was very effective in migraine. Others found that moderate vitamin C deficiency was often encountered in medical practice. Pelner noted that there was a reduction in sensitivity to salicylates and to the sulfonamide compounds when vitamin C was administered in large doses. The tensile strength of wounds is higher in animals having a high vitamin C content.

The authors discuss the intake of foods, pointing out that vitamins are merely activators. Without the proper foods, or raw materials, the activators are useless. The importance of an adequate intake of minerals is emphasized. Intake of the proper raw materials and vitamins is particularly important for pregnant women and infants.

Hitschler, Philadelphia. [Arch. Otolaryng.

HE VITAMIN FACTOR IN THE ETIOPATHOGENESIS OF DYSTROPHIES. RAMIRO PAVON CABALLERO, Bol. Soc. cubana de pediat. **15**:285 (May) 1943.

This is a general dissertation on the multiple dystrophic states of infancy due to vitamin deficiency—ickets, scurvy, the syndrome of pellagra-beriberi scribed by Professor Castellanos and so forth—and on e importance of knowing the etiopathogenesis of each these states for the early administration of vitamins.

KEITH, Rochester, Minn.

Hygiene; Growth and Nutrition; Public Health

EALTH EXAMINATION FOR SCHOOL CHILDREN REQUIRED BY LAW. RAY O. DUNCAN, Illinois M. J. **86**:17 (July) 1944.

The sixty-third general assembly of Illinois passed a w which requires that all pupils of elementary and condary schools, with certain exceptions, immediately ior to or on their entrance into the first grade, and t less frequently than every fourth year thereafter all have physical examinations. Additional health aminations may be required when they are deemed cessary by school authorities.

Such examinations shall be made by physicians and ntists licensed to practice in the state. Cumulative cords of such examinations shall be kept by the school thorities.

A pupil objecting to physical examinations on constitional grounds shall not be required to submit himself such examination if he presents to the board of ucation a statement of such objection signed by a rent or a guardian. Exempting a pupil from the ysical examination does not exempt him from reired participation in the program of physical educaon and training provided in the act.

BARBOUR, Peoria, Ill.

TUDIES ON THE DEVELOPMENT OF ARGENTINE CHILDREN. ENRIQUE C. R. BONFILS, Arch. argent. de pediat. **21**:485 (June) 1944.

The development of school children of the city of araná, Argentina, was studied with special regard to ight, weight and thoracic expansion. Mayet's index as determined as well.

A comparison is given between children from Buenos ires and from Paraná.

CASSORLA, Chicago.

OW'S MILK AND HEALTH LEGISLATION. MAXIMINO FERRER CARTAYA, Bol. Soc. cuba de pediat. **15**:389 (June) 1943.

The author discusses the composition, qualities, rmentations, and so forth, of whole cow's milk and mes the diseases which may be transmitted by the ilk. The regulations in regard to all phases of milk ntrol are cited in detail.

KEITH, Rochester, Minn.

Prematurity and Congenital Deformities

HE CARE OF CLEFT LIP AND PALATE IN BABIES. LOUIS W. SCHULTZ, Illinois M. J. **86**:138 (Sept.) 1944.

This treatise on cleft lip and palate in babies, dissing causation, varieties, complications, time for eatment, anesthetics, surgical repair, care and progsis, is too comprehensive and detailed for adequate stracting.

BARBOUR, Peoria, Ill.

TWO CASES OF DOLICHOSTENOMELIA [ARACHNODACTYLY]. T. VALLEDOR, L. VIAMONTE and LORENZO EXPÓSITO, Bol. Soc. cubana de pediat. **15**: 583 (Sept.) 1943.

Two cases of arachnodactyly are reported. This condition represents a congenital dystrophy involving tissues of mesodermic origin. The main symptoms are (*a*) excessive length and slimness of the bones, particularly in the distal segments of the extremities; (*b*) underdevelopment of the muscles and lack of fat; (*c*) laxity of ligaments and tendons, permitting an exaggerated range of movements in the joints. There are frequently congenital abnormalities of the eyes.

KEITH, Rochester, Minn.

Newborn

ERYTHROBLASTOSIS FOETALIS: A CASE REPORT. EMANUEL B. BRANDES and HARRY R. CUSHMAN, J. Pediat. **25**:239 (Sept.) 1944.

Brandes and Cushman report a case in which erythroblastosis fetalis was successfully treated with blood transfusions.

They particularly emphasize the importance of using Rh-negative blood if adequate response is expected and show by charts the difference in hemopoietic activity which results when Rh-positive and Rh-negative bloods respectively are administered. After three transfusions of Rh-positive blood a rise of only 1,000,000 in the total red cell count was obtained, which within three days dropped 400,000. Conversely transfusion of Rh-negative blood resulted in an immediate increase of 1,500,000 red blood cells—a count which not only was maintained but was effective in stimulating hemopoiesis in the infant such that further therapy was unnecessary and complete recovery resulted.

The authors conclude that Rh-negative blood should be used in the treatment of this condition, but feel that when it is not immediately available transfusion of compatible Rh-positive blood may be of value in maintaining life until a suitable donor is obtained.

BRANDES, P. A. Surg. (R) U.S.P.H.S.

CLINICAL OBSERVATIONS IN THE TREATMENT OF EPIDEMIC DIARRHEA OF THE NEWBORN. NINA A. ANDERSON and WALDO E. NELSON, J. Pediat. **25**: 319 (Oct.) 1944.

In an outbreak of epidemic diarrhea of the newborn involving 24 full term and 4 premature infants, 1 premature infant died. Among these infants, 7 were classified as critically ill, 8 as seriously ill, 8 as moderately ill and 5 as mildly ill. In all of the infants the disease developed within seven days.

Bacteriologic studies revealed a para-aerogenes type of paracolon bacillus in the stools of 9 of these infants. No specific antibodies could be demonstrated in serums collected from 7 of the infants two to four weeks after the onset of the disease.

The obstetric department was closed to new admissions, the attacked infants segregated from the exposed ones and a temporary obstetric unit for new patients established on another floor of the hospital, from which the nurses and the physicians responsible for the ill infants were excluded. Infants who had been discharged recently from the nursery were followed closely for any evidence of the disease.

The plan of treatment included substitution of a modified oral feeding for the milk feeding, subcutaneous

and intravenous administration of fluids, correction of states of acidosis by parenteral administration of alkali and oral administration of synthetic ascorbic acid and thiamine hydrochloride. Several of the infants received transfusions of blood or of plasma. All of the infants received succinylsulfathiazole orally.

Of particular importance were the detection of states of acidosis in infants many of whom did not present the classic clinical picture of acidosis and the satisfactory clinical response to attempts at correction of the acidosis either with 5 per cent solution of sodium bicarbonate given intravenously or with sixth-molar solution of sodium-lactate given subcutaneously and/or intravenously in calculated amounts. In 50 per cent of the instances in which the infants showed abnormal manifestations the carbon dioxide-combining power of the blood was 35 volumes per cent or less. Criteria for carbon dioxide determinations included listlessness, restlessness, failure to gain weight or loss of weight, cherry red lips, hyperpnea and diarrheal stools.

The need for constant observations of the ill infants is stressed, and it is suggested that carbon dioxide determinations be obtained whenever there is evidence of increased severity of illness with or without the usual manifestations of acidosis.

ANDERSON, Philadelphia.

INFECTION IN THE NEWBORN. J. L. HENDERSON, Edinburgh M. J. **50**:535 (Sept.) 1943.

The author speaks of the Honyman Gillespie lectures, given in Edinburgh, Scotland, in 1943 by Professor McNeil and Dr. Agnes MacGregor, in which the problem of infection during the first month of life was referred to. Henderson goes into greater detail as to the problem of infection in the first month of life. He states that infections rarely bring on death in the first three days or in the latter part of the first week: It is after the first week that most of the deaths are caused by infection. He cites 71 fatalities from infection from the second to the fourth week inclusive, while there were only 43 deaths from all other causes.

Efforts to prevent cross infection in maternity hospitals must deal with overcrowding of infants in nurseries, absence of barrier-nursing precautions and in many cases inadequacy of the nursing staff. The author states that the prevalence of cross infections found nowadays in hospitals, about one hundred years after the discoveries of Pasteur and Lister, is a poor tribute to the memory of these men.

NEFF, Kansas City.

Acute Contagious Diseases

CONGENITAL CATARACT AND OTHER ANOMALIES FOLLOWING GERMAN MEASLES IN THE MOTHER. ALGERNON B. REESE, Am. J. Ophth. **27**:483 (May) 1944.

All 3 of the author's patients had congenital cataracts and congenital cardiac lesions. All mothers contracted German measles within the first month of pregnancy. The author asks a few pertinent questions, such as: Is the infection of the mother really German measles, and, if so, why have the congenital anomalies reported by him not been observed previously? Can any prophylactic measures be taken to prevent pregnant women from contracting German measles during the first three months of pregnancy, and should a pregnant woman who contracts an exanthem in the first three months of pregnancy have abortion performed?

STRAKOSCH, Denver. [Arch. Dermat. & Syph.]

RELATIONSHIP OF POLIOMYELITIS AND TONSILLECTO
R. E. HOWARD, Ann. Otol., Rhin. & Laryng. 53
(March) 1944.

Howard reviews the reports of the relation betw poliomyelitis and tonsillectomy. Such a relation first suggested as early as 1910. The organism causes poliomyelitis is a filtrable virus which may presented on any surface of the gastrointestinal tr from the lips to the lower part of the bowel, of a per afflicted with the disease, a convalescent patient o carrier. It is widely distributed among normal pe but manifests itself only in susceptible ones. infection may be transferred by hands, hankerchi towels and other articles recently handled by so-ca carriers or by persons having the disease. It may be spread by coughing, sneezing, loud talking or lau ing. The recovery of the virus from sewage and in infected areas makes one believe that there indirect methods of spread. The consensus at pre is that the virus enters through the mucosa of alimentary tract.

In his conclusions the author makes the follow statements: The possibility of poliomyelitis follow removal of tonsils and adenoids during July, Aug September and October in nonepidemic years is mini but when it does occur it is serious and often bulbar type. The ratio is 1 in 2,000 operations. possibility of the disease following the operation in other eight months is nil except in Texas and Califor where the season for poliomyelitis lasts from June November, and occasionally to December. Preven medicine as practiced now by the boards of he throughout the nation shows that during the mo and years when there are epidemics of poliomyeli operations on the nose and the throat should be avoi whenever possible.

M. V. MILLER, Philadelphia [Arch. Otolaryng.

COMBINED IMMUNIZATION AGAINST PERTUSSIS, DI THERIA AND TETANUS. PAUL M. HAMILTON E. G. KNOUF, J. Pediat. **25**:236 (Sept.) 1944.

Sixty-four normal infants between the ages of 12 18 months were given a combined mixture of antig to induce immunity to diphtheria, whooping cough tetanus by one series of inoculations. The fluid toxo of diphtheria and tetanus were produced, tested, ste ized and titrated for dosage in the usual way; to mixture of the two toxoids pertussis phase I vacc was added to yield 40,000,000,000 organisms per c centimeter. The doses were 0.5, 1 and 1 cc., given s cutaneously at intervals of one month. Three mon later samples of blood were tested for their agglutin ing titer against the pertussis organism and for th content of diphtheria and tetanus antitoxins.

Results showed as consistent and as high a deg of immunity as is expected when each procedure done separately. Reactions to inoculations were usua entirely absent, and in no case were they troublesom

It is suggested that such a simplified procedure, w its saving of time for doctors and its appeal to paren may result in more nearly universal immunization infants.

HAMILTON, San Marino, Calif.

RUBELLA EARLY IN PREGNANCY CAUSING CONGENI MALFORMATIONS OF EYES AND HEART. CARL ERICKSON, J. Pediat. **25**:281 (Oct.) 1944.

The author reports the cases of 11 infants w congenital cataracts, 9 of whom had noncyanotic he disease as well, whose mothers had rubella during

few months of pregnancy. The fact that embryonic ues are very susceptible to virus infections makes eem plausible that the mothers had a mild systemic ction due to a virus, which attacked the growing s and injured structures which were in early stages levelopment, namely, the lens and the heart. Other ctions due to viruses have at times been incriminated, other malformations are occasionally produced.

AUTHOR'S SUMMARY.

TUSSIS: BACTERIOLOGIC AND AGGLUTINATION STUDIES. JESSE G. M. BULLOWA, LILLIAN BUXBAUM and IRVING E. SCHEINBLUM, J. Pediat. **25**: 299 (Oct.) 1944.

Early diagnosis of pertussis is desirable both from epidemiologic standpoint and for treatment, and it is especialy difficult. The Chevitz-Meyer cough e method for obtaining cultures has been used since 6 by many workers, with varying results. In 1940 dford and Slavin adopted the nasopharyngeal swab culturing Hemophilus pertussis from patients with ooping cough and had much greater success. Patients' lutinin titers have also been determined and an effort le to adapt this procedure to diagnostic purposes, many conflicting reports are found in the literature. an effort to evaluate the laboratory methods for diagnosis of pertussis cough plates, nasopharyngeal bs and mucus obtained by laryngeal suction were en for cultures at the same time as blood for ermining the agglutinin titer from 53 patients showclinical evidence of whooping cough.

The "cough plate" cultures were obtained by holding Petri dish containing the medium 6 inches (15 cm.) n the patient's mouth for from thirty to forty ghs during a paroxysm. The nasopharyngeal swabs re taken by passing a straight wire with a sterile on tip through the nares to the posterior pharyngeal l. A rubber catheter attached to a suction bulb used to aspirate mucus from the larynx.

A modification of the Bordet-Gengou medium with teose peptone and nicotinic acid was used for turing all specimens. The nasopharyngeal swabs re rotated on the corner of one plate and then by the of a straight wire were streaked through the ner and serially onto a second plate. The laryngeal retions were treated in a like manner except that e plates were used. In this manner individual onies of H. pertussis, free from secondary microanisms, were obtained. Typical colonies were ntified by stained smears and were confirmed by lutination.

Agglutination titers were determined by the slide hod (Mishulow's modification of the Welsch-Stuart). Varying amounts of patient's serum and a ndard antigen (Lilly) were used.

The 53 patients studied were young children, 28 ng under 1 year, 18 between 1 and 3 years and 7 ween 3 and 6 years of age. The duration of illness ged from three to forty-four days at the time of culture and the agglutination test. H. pertussis was ated from 40 (75.5 per cent) of the patients by one more of the methods. Specimens obtained by nasoryngeal swabs yielded the greatest number of itive cultures (87.5 per cent), and laryngeal suction ded more positive cultures than cough plates in ry age group and in every week of illness.

However, the suction method of obtaining specimens found to be cumbersome, and therefore it is not sidered desirable as a routine procedure. Cough es in combination with nasopharyngeal swabs were nd to yield the greatest number of positive cultures. ere was direct correlation between the duration of illness and the number of positive cultures obtained; 83.3 per cent during the first ten days of illness and 60 per cent during the fourth week of illness.

There was little correlation between results of cultures and agglutination titers. Of the 38 patients who had positive cultures only 9 showed the presence of agglutinins, and of the 12 patients who had negative cultures 3 had demonstrable agglutinins. Although the age of the patients seemed to have no bearing on the production of agglutinins, the duration of illness played a significant role, as only 3 patients had detectable agglutinins before the second week of illness.

BULLOWA, New York.

ACUTE POLIOMYELITIS DURING PREGNANCY. ALFRED FLAUM, Nord. med. **18**:563 (April 3) 1943.

A 27 year old woman in her first pregnancy fell ill two days before delivery with typical signs of poliomyelitis and died a few days later of respiratory paralysis. The infant was healthy and remained so.

WALLGREN, Stockholm, Sweden.

POLIOMYELITIS IN PREGNANCY. ÅKE NETTELBLAD, Nord. med. **18**:657 (April 17) 1943.

This is a report of 6 cases of poliomyelitis involving pregnant women. One of the women died after cesarean section, performed in order to facilitate the breathing, which was impaired through paralysis of the diaphragm. The infant died. Another infant displayed a certain degree of atrophy of the muscles, which was thought to be due to intrauterine poliomyelitis. In the 4 other cases the children were normal and had suffered no harm from the poliomyelitis which their mothers had during their fetal period.

WALLGREN, Stockholm, Sweden.

CASE OF PAROTIC MENINGITIS WITHOUT SIGNS OF PAROTITIS. ADOLPH H. MEYER, Nord. med. (Hospitalstid.) **17**:257 (Feb. 13) 1943.

A 6 month old boy had convulsions and fever. The spinal fluid contained many cells, of which 70 per cent were lymphocytes and 30 per cent larger mononuclear cells. The sugar content of the urine was 54 per hundred cubic centimeters. The patient became afebrile after one week and was discharged healthy. The salivary glands were not enlarged and showed no tenderness. The boy was the fifth of 5 siblings, of whom 3 had had parotitis.

WALLGREN, Stockholm, Sweden.

A CLINICAL SYNDROME IN CHILDREN RESEMBLING RHEUMATIC FEVER. ALBERT D. KAISER, New York State J. Med. **43**:1937 (Oct. 15) 1943.

This is part of a symposium on rheumatic fever. In acute rheumatic fever in children the heart is probably always involved, and the discovery of some type of cardiac involvement is necessary for a correct diagnosis. Kaiser reports a group of 200 cases of a condition that resembled rheumatic fever except that there were no murmurs. The electrocardiograms were normal, and there was little change in the sedimentation rate. He believes that these represent a separate clinical syndrome and should not be considered rheumatism. The condition has much the same pattern as rheumatic fever, with pain in the knees, legs and thighs, fatigue, pallor, loss of appetite, slight rise in temperature, sore throat, headache and epistaxis. The patients respond to salicylates and to rest in bed. There is a familial tendency, and there may be recurrences.

AIKMAN, Rochester, N. Y.

PREVENTION OF RHEUMATIC RECURRENCES. ANN G. KUTTNER, New York State J. Med. **45**:1941 (Oct. 15) 1943.

This is part of a symposium on rheumatic fever.

Convalescent or sanatorium care provides rest in bed and increases the child's resistance. Vitamin therapy has shown no appreciable results in preventing rheumatism. Changes in climate reduce the number of recurrences, but the results are not impressive. Desensitization has not been particularly satisfactory. Salicylates used prophylactically are of value. Kuttner's studies show that it is most important to reduce the incidence of streptococcic infections of the upper respiratory tract. This is best done by the use of sulfanilamide—1 or 2 Gm. daily between attacks. She reports more toxic reactions than are shown by Coburn, Thomas and others.

AIKMAN, Rochester, N. YY.

INFECTION WITH STRONGYLOIDES IN CHILDREN IN BAHIA. ELIEZER AUDIFACE, Pediat. puericult. Bahia **13**:39 (Sept.) 1943.

Strongyloides stercoralis parasitism is common in Bahia, and in every child with chronic diarrhea a search for the worms should be made. Medication is not very efficacious; gentian violet is the most satisfactory agent, although it is poorly borne by some and the results are frequently disappointing. When it is not tolerated by mouth, 15 cc. of a 2 per cent solution may be given by rectum. In addition to profound cachexia, there are severe hypochromic anemia and constant eosinophilia. All organs of the body may be attacked by this parasite.

DWYER, Kansas City, Mo.

SULFANILAMIDE IN THE TREATMENT OF ACUTE BACILLARY DYSENTERY IN CHILDREN. K. T. CHEN and I. L. TANG, Chinese M. J. **61**:110 (April-June) 1943.

The authors state that the most common infection during the summer months in China is bacillary dysentery, although typhoid is nearly as frequent. Between them the two diseases fill nearly all of the beds in the children's wards. The patients' stay in the hospital averages about three weeks when there is no specific or effective therapy for the bacillary dysentery, and many young children die of the disease each year.

Only patients who are severely infected or acutely ill are admitted to the hospital. Treatment with sulfonamide compounds is now the therapy of choice, the daily dose being 100 to 150 mg. per kilogram of body weight; a third or a quarter of the total twenty-four hour allowance is given as the initial dose each day. Sodium bicarbonate is given with the sulfanilamide. Improvement usually occurs by the fourth day, at which time the dose is reduced; the medication is continued for as many as five days. Of 52 patients thus treated (2 of whom received sulfathiazole instead of sulfanilamide) 2 showed toxic effects, which consisted of hematuria in 1 instance and pneumonia, hemolytic anemia and death in the other. Of 25 patients with severe infections 3 died.

The results of the treatment with sulfonamide compounds were definitely good. In most cases an improvement in the general condition took place within twenty-four hours. Subsidence of the fever was the second evidence of improvement in order of frequency and of appearance; concurrently the stools became reduced in number. There has been a definite shortening in the stay in the hospital since this treatment has been used.

NEFF, Kansas City, Mo.

Chronic Infectious Diseases

TUBERCULOUS ALLERGY. ALBERTO CHATTAS, A argent. de pediat. **21**:504 (June) 1944.

A historical survey of tuberculin as a diagnostic is given. The ordinary technics for tuberculin t such as those for the von Pirquet, Mantoux, Moro patch tests, are described and critically analyzed.

Theoretic considerations about tuberculous alle anergy and preallergy are given, with especial me of temporary and constitutional energy, iatergy, l allergy, etc.

The clinical value of the tuberculin test is fi emphasized, along with a critical study of its limitat as a specific therapeutic agent.

CASSORLA, Chicag

SYMPOSIUM ON THE PRIMARY INFECTION OF TU CULOSIS AND CHILDHOOD: INTRODUCTION. GUS CARDELLE, Arch. de med. inf. **13**:73 (April-Ju 1944.

This entire issue of the journal is devoted to infa tuberculosis. In the introductory article the var classifications of the disease are discussed.

SANFORD, Chicag

SYMPOSIUM ON TUBERCULOSIS: PATHOLOGY DIAGNOSIS. GUSTAVO CARDELLE, Arch. de med. **13**:84 (April-June) 1944.

This excellent article should be read in full. interesting point is the frequency of positive reac to tuberculin tests in the Children's Hospital Hab Cuba: 3.3 per cent in infants up to 3 months of 8.9 per cent in infants 4 to 6 months of age, 12.8 cent in infants 7 to 9 months of age, 12.9 per ce infants 10 to 12 months of age and 14.3 per ce infants 13 to 24 months of age. In the author's s the mortality from a primary infection was as follo 1 day to 12 months, 45 per cent; 13 months to 2 y 38.7 per cent; 3 years to 7 years, 4.8 per cent, a to 12 years, 0 per cent. In the diagnosis, the t leukocyte count is of interest. It was under 10,00 only 16 instances, while it was between 11 and 2 in 48 instances, between 21 and 30,000 in 22 insta between 31 and 40,000 in 13 instances and over 4 in 3.

SANFORD, Chicag

SYMPOSIUM ON TUBERCULOSIS: CLINICAL RADIOL RAÚL PEREIRAS and B. SÁNCHEZ SANTIAGO, A de med. inf. **13**:124 (April-June) 1944.

Twenty-two excellent roentgenograms are shown, the related cases are discussed. This article shoul read in full.

SANFORD, Chicag

SYMPOSIUM ON TUBERCULOSIS: COMPLICATIONS. G TAVO GARCÍA MONTES, Arch. de med. inf. **13** (April-June) 1944.

The complications discussed are atelectasis obstructive emphysema, bronchiectasis and spontan pneumothorax. These conditions are illustrated roentgenograms and clinical studies.

SANFORD, Chicag

SYMPOSIUM ON TUBERCULOSIS: ANATOMIC PATHOL JUAN A. JIMÉNEZ, Arch. de med. inf. **13** (April-June) 1944.

Photomicrographs and photographs of gross s mens are shown in illustration of the various t

lesions. An excellent schematic drawing is given, wing the mode of formation of the various lesions.

SANFORD, Chicago.

MPOSIUM ON TUBERCULOSIS: PROPHYLAXIS AND TREATMENT. ROBERTO VALDÉS DÍAZ, Arch. de med. inf. **13**:176 (April-June) 1944.

The author recommends vaccination with BCG as a n of prophylaxis and outlines the method in use in a. The principles of active treatment can be grouped er three major headings: (1) protection against re infections; (2) absolute rest for the organism; marshaling the best conditions as a defense against infection.

SANFORD, Chicago.

DING OF THE TUBERCULOUS CHILD. SANTIAGO BERNARDINO NAVARRO, Bol. Soc. cubana de pediat. **15**: 303 (May) 1943.

The author starts his article with a general consideration of nutritional factors (protein, carbohydrates, minerals and vitamins) and their respective sources. erring, then, to the feeding of the tuberculous child, states that the child must not be overfed and must what he is able to digest, although his extra needs minerals and fats because of his growth must always considered. Other factors to consider are fever, ree of infection, malnutrition and climate.

The presence of diarrhea or of constipation may essitate special diets, and secondary infections, because of their influence on appetite, must receive adete treatment. The diet must be pleasant to the d, must be rich in proteins and fats and must fill ric requirements. For an infant breast milk is the choice and cow's milk, if tolerated, the second. or a critically ill patient, for example, a child with ingitis, feeding by tube is necessary.

KEITH, Rochester, Minn.

E HYGIENE OF THE TUBERCULOUS CHILD. EVA PAGOLA, Bol. Soc. cubana de pediat. **15**:429 (June) 1943.

This is a discussion for nurses of the general principles underlying the care of patients with tuberculosis the prevention of the spread of infection. "The phylaxis of tuberculosis is above all a problem of cation."

KEITH, Rochester, Minn.

MARY CERVICAL TUBERCULOSIS IN THE CHILD—"MACROADENOPATHY" T. VALLEDOR, Bol. Soc. cubana de pediat. **15**:455 (July) 1943.

ine cases of primary cervical tuberculosis in small dren are reported. Seven of the children were 3 rs of age or younger; 5 were white and 4 Negro. 7 cases a member of the family or some other per- was the source of infection, 1 was considered due ontaminated milk and in 1 no source could be found. 1 instance a cutaneous lesion was present on one k. In 8 cases the adenitis involved all the cervical ph nodes. Consecutive involvement of the mediasl lymph nodes was noted in 4 instances—in 1 the olvement was contemporaneous. The reactions to Mantoux test were strongly positive and the hrocyte sedimentation rate accelerated in the entire es. In 5 cases biopsy confirmed the diagnosis. ients were observed from a few months to five rs. Treatment was conservative, without surgical rvention. All patients were given iodine by mouth. lesions in the lungs were observed at any time, the progress of all the patients was good. The cases are reported in detail with illustrations, roentgenograms, photographs of patients and specimens.

KEITH, Rochester, Minn.

EPIDEMIOLOGIC INVESTIGATION OF TUBERCULOSIS. T. VALLEDOR, A. FERIA, J. CORNEJO and A. FERNÁNDEZ BALTRÓNS, Bol. Soc. cubana de pediat. **15**:561 (Aug.) 1943.

This is a report of the results of tuberculin tests on children of various ages attending the Hospital Mercedes in Habana, Cuba. The percentage of positive reactions in children from birth to the age of 13 years was 23.03 during the years 1940 and 1941. There were approximately twice as many positive reactions among Negro infants as among white infants, a circumstance which probably reflects poor hygienic conditions among the Negro families.

KEITH, Rochester, Minn.

COEXISTENCE OF PULMONARY SUPPURATION AND TUBERCULOSIS IN CHILDREN. RAUL MATTE L. and SERGIO IBAÑEZ Q., Rev. chilena de pediat. **14**:887 (Dec.) 1943.

The authors point out that often only careful, prolonged study can differentiate between pyogenic pulmonary abscess and tuberculous cavitation; suppurative pulmonary disease may often activate healing tuberculosis. Five illustrative cases are presented.

PLATOU, New Orleans.

BACILLARY DYSENTERY IN CHILDHOOD. ALFONSO COSTA and HERNAN ROMERO, Rev. chilena de pediat. **14**: 905 (Dec.) 1943.

Results of 1,622 stool cultures taken from 618 sick infants are analyzed. One hundred and thirty-two of the infants had clinical enterocolitis. In 29.1 per cent of the 132 cases dysentery organisms were isolated on lactose agar and were further identified by agglutination reactions; Shiga's type was found 8 times; Flexner's 25 times and Sonne's 6 times. From 488 sick infants without enterocolitis (controls), only 2 positive cultures were secured. Clinical features influencing the course of the dysenteries are discussed.

PLATOU, New Orleans.

Diseases of Blood, Heart and Blood Vessels and Spleen

INCREASED RED BLOOD CELL FRAGILITY AFTER FAT INGESTION. JOAN LONGINI and VICTOR JOHNSON, Am. J. Physiol. **140**:349 (Dec.) 1943.

The statement that ingested fat may be injurious to red blood cells has appeared in medical literature. The authors set out to investigate whether this might be true. Their studies were made with dogs. They found that after ingestion of fat an agent which increases the fragility of red blood cells is present in dog's serum. Neutral fat is not this agent. Free fatty acids and soaps reaching the blood stream by way of the lymphatics are probably responsible for the effect. Ingestion of carbohydrates and proteins does not increase the fragility of the red cells. On the contrary, meals rich in these substances produce serum which may actually protect red cells from water hemolysis. The suggestion is made that those physiologic mechanisms which delay the absorption of fat and its entrance into the blood stream are probably significant in the prevention of anemia.

STOESSER, Minneapolis.

COR BILOCULARE. FRED R. SHECHTER and DAVID R. MERANZE, J. Pediat. **25**:150 (Aug.) 1944.

A case of cor biloculare is reported involving a girl born at term who lived twenty-three days. The important anatomic changes noted at autopsy were displacement of the heart into the right side of the thoracic cavity, a cor biloculare with dilatation, particularly of the ventricle, a hypoplastic systemic aorta with virtual functional atresia, a persistent and prominent ductus arteriosus and diffuse ventricular endocardial fibrosis. No other somatic anomalies were present. Clinically, cyanosis was the outstanding symptom. The infant died of cardiac failure

AUTHORS' SUMMARY.

PERIARTERITIS NODOSA. EDWIN PAUL SCOTT and C. C. ROTONDO, J. Pediat. **25**:306 (Oct.) 1944.

The authors report 2 cases of periarteritis nodosa in children in which death was sudden. Periarteritis nodosa of the coronary arteries was demonstrated at autopsy in both patients; in 1 there was fatal intrapericardial hemorrhage due to rupture of an aneurysm resulting in tamponade, and in the other the pathologic changes were so extensive that rupture of the coronary vessels seemed imminent.

SCOTT, Louisville, Ky.

ABNORMAL ORIGIN OF THE LEFT CORONARY ARTERY WITH EXTENSIVE CARDIAC CHANGES IN A FEMALE CHILD THIRTEEN MONTHS OLD. FREDERICK PROESCHER and FRANZ W. BAUMANN, J. Pediat. **25**:344 (Oct.) 1944.

The authors report the case of a 13 month old girl with so-called chronic bronchitis in whose left lung there had developed what would appear to be an acute pneumonic process. The infant was hospitalized twenty-four hours after onset of this acute condition and died shortly thereafter. Laboratory tests had not been completed. Autopsy revealed that the left coronary artery originated from the pulmonary artery instead of from the aorta. The heart was greatly enlarged and showed numerous degenerative changes with necrosis and calcification of muscle fibers. So-called embryonic sinusoids, previously seen by other authors only in the myocardium, were seen not only in that structure but in the pericardium. The authors' patient is the oldest infant in whom origin of the left coronary artery from the pulmonary artery has been reported. It appears that some patients do not present the clinical history which, according to a previous reviewer, suggests the presence of this anomaly. Attention is called to the observation that this condition appears to be more frequent in female infants. Photomicrographs accompany the article.

AUTHORS' SUMMARY.

A CASE OF INTERAURICULAR COMMUNICATION. ALFREDO E. LARGUIA and JUAN C. CAPRILE, Arch. argent. de pediat. **21**:533 (June) 1944.

A case of a 13 year old girl presenting a form of cardiopathy which after extensive consideration was classified as interauricular communication is reported.

This condition is a variety of the Abbott type of "cardiopathy with late cyanosis." Comments on the diagnostic importance of roentgen films, angiocardiography and electrocardiography are given.

CASSORLA, Chicago.

Diseases of Nose, Throat and Ear

STUTTERING: I: A CRITICAL REVIEW AND EVALUAT OF BIOCHEMICAL INVESTIGATIONS. HARRIS H J. Speech Disorders **9**:245, 1944.

This is a review of modern literature on the chemistry of stuttering. No corroborative findings been made in regard to a possible biochemical caus stuttering. The author believes that if such find were made they could be demonstrated to be the re rather than the cause of stuttering.

PALMER, Wichita, Ka

AUDITORY MEMORY SPAN FOR MEANINGLESS S LABLES. HELEN HULICK BEEBE, J. Speech Disor **9**:273, 1944.

Observations on a group of 207 children ranging age from 4 years to 8 years 5 months, including 86 b and 121 girls, were compared with the findings of W and Froeschels in German children. The average va for the auditory memory span fell below those for German-speaking children. The small number of s jects, however, does not make for complete confirma of these results.

PALMER, Wichita, Ka

DIAGNOSIS AND TREATMENT OF SINUSITIS IN CHILDR D. E. STAUNTON WISHART, Laryngoscope **54** (March) 1944.

Sinusitis is frequent in children, occurring in perh 30 per cent.

Much more should be known of the anatomy the physiology of the nose. The author shows that bony structure and the mucosa of the inferior turbi are of a little known and very special design. describes it from the point of view of anatomy. also describes the ostiums of the sinuses. They be compared to manholes almost completely filled w hoses (nerves, arteries, veins). Injury to a s ostium may seriously damage the sinus. The mid turbinate region is the most important from the p of view of the etiology of sinusitis, for most of sinuses open into this area.

In the diagnosis of sinusitis a careful history is portant. The symptoms include stuffy nose, nasal charge, nasopharyngitis, protracted fever, cough, p nasal drip (only older children notice it), headac (rare up to the age of 6), pain and impairment of sense of smell (indicative of ethmoiditis).

The histopathologic changes in disease of the sinu are described. The importance of preventing the on of chronic sinusitis is stressed.

Careful shrinking, transillumination and nasophar goscopic and roentgen examinations should be carr out in order to establish a diagnosis. Radiopaque s stances are often of value.

Sinusitis must be differentiated from allergic rhini Many of the symptoms and signs are not reliable differential diagnosis. Two things are reliable, howev (1) the impossibility of shrinking the nasal mucosa the allergic patient with cocaine, epinephrine or eph rine and (2) the appearance of an excessive number eosinophils in the nasal secretions and the sputum allergy.

Treatment is discussed. Splashing the face with c water and using the steam kettle often improve physiologic function. Crying and sneezing are a in getting rid of nasal secretion. The use of fair acid nose drops is recommended. Stagnant, thick mu promotes bacterial growth and should be remov

gations with warm saline solutions help remove it. y must be given properly (the face downward). lateral head low position is also good. With it middle meatus can be shrunk and cleared. Wash- of the maxillary sinus by a needle puncture under middle turbinate is recommended, while washing a natural ostium is condemned.

The author does not treat children's sinuses by dis- rement. The child is afraid, and its confidence is Furthermore, uninfected sinuses may become in- ed. Tampons or packs are condemned. Short wave roentgen treatment have not proved beneficial. The ults of treatment with sulfonamide compounds are ouraging but not conclusive. The protracted use of onamide compounds is not advised.

The author disapproves in general of surgical opera- on the sinuses in children. Excellent results were ieved by conservative therapy at the Hospital for Children, in Toronto, Canada. In each case the ase must be first properly diagnosed and then ted conservatively. The surgeon must perform only sures that are needed and no more. He must handle postoperative care himself. The purpose of surgical rvention is to restore the nose and sinuses to a good siologic condition.

The removal of the anterior third of the middle inate is often of great value, particularly if it blocks middle meatus. Better drainage results.

The inferior turbinate has great functional value and uld not be disturbed. Removal, cauterization and gulation of this structure should not be performed. Major surgical procedures have their place but should avoided if possible.

HITSCHLER, Philadelphia. [ARCH. OTOLARYNG.]

ATMENT OF EXTERNAL OTITIS: I. LOCAL SULFONAMIDE THERAPY. BEN H. SENTURIA, Laryngoscope 54:277 (June) 1944.

External otitis is an important disease in the warmer ates. The causative organisms are probably a mix- of both bacteria and fungi. The bacteria may be ous kinds of streptococci, staphylococci, diphtheroids Bacillus pyocyaneus. The fungi may be spores of icillium, Aspergillus and Monilia. They are sapro- ic fungi. True pathogenic fungi are rarely found. ungi need carbohydrates for their growth. They rish in ear wax. Moisture is necessary for them to in close contact with their source of energy. Toxins produced by the growth of the fungi. These irritate surface epithelium. The bacteria present then in- this irritated epithelium.

igns and symptoms vary from a feeling of blockage, ess, itching, scaling, or slight tenderness on manipu- n of the external canal to varying amounts of pain, na of the wall of the canal, glandular swelling and t fever.

treatment, a mixture of sulfanilamide, sulfathiazole zinc peroxide powders (4:2:2) was found most acious. It was blown into the ear after this had cleaned mechanically and with hydrogen peroxide. he patients were seen daily for several days. Seda- was given as necessary. As the condition improved, ation with sodium bicarbonate solution was used to n out all the accumulated debris and powder. Irri- on was done only when the edema and the tender- had subsided enough to permit drying of the canal rward. This was followed with instillation of hol. In several minutes this was allowed to run The residuum in the canal soon evaporated. Powder was then reapplied and left in for a week. The patient was cautioned against getting water into or about the ears, and swimming was forbidden.

In all the cases of acute infection the condition responded well, only 1 patient in 33 requiring more than seven days for a complete cure. No recurrences were observed. In other cases, as a control, treatment was by dry wipes, alcohol and sulfanilamide in alcohol. In these the condition did not respond so quickly, and in some recurrences were noted. Auditory acuity was unaffected.

HITSCHLER, Philadelphia. [ARCH. OTOLARYNG.]

RADIATION THERAPY OF LYMPHOID TISSUE IN THE NASOPHARYNX AND PHARYNX. HOWARD HICKS ASHBURY, Radiology 43:250 (Sept.) 1944.

Ashbury reports the results he obtained by treating lymphoid tissue in the nasopharynx and the pharynx with high voltage roentgen therapy. He noted marked improvement in cases of conduction deafness, obstruction of the ostiums and infection when the conditions were due to lymphoid tissue. Five pairs of treatments were given over a period of thirty days. The less responsive patients were ultimately treated by applying radium directly to the lymphoid tissue (75 mg. per hour). One hundred and fifty-seven patients were treated, most of whom were in the first decade of life.

ANSPACH, Chicago.

AN ELECTROENCEPHALOGRAPHIC STUDY ON THE MOMENT OF STUTTERING. NORMAN WILLIAM FREESTONE, Speech Monogr. 9:28, 1942.

The author reviews all previous studies of the same problem, showing that there is no general agreement in their conclusions. Twenty normal speakers and 20 stutterers, chosen without regard for handedness, were studied by means of a Gras electroencephalograph as to left and right frontal areas 1 to 6, left and right lower motor areas 2 to 5, left and right occipital areas 3 to 4 and left and right upper motor areas 7 to 8. The author does not report the sex distribution. Many of the previous findings failed to be confirmed. The brain potentials of stutterers are statistically different from those of normal persons in many areas.

The following general conclusion is reached: Psychologic stimuli must impinge on certain basic neurologic differences before stuttering can result. These differences are due to a lack of heightened foci of cerebral activity, a condition which is akin to reduced consciousness.

The following specific conclusions are reached: 1. Stutterers are neurologically differentiated from normal persons. 2. The proper stimulation of the neurologic differences forces stutterers to function in a relative state of reduced consciousness. 3. States of reduced consciousness, seen as a lack of heightened foci of cerebral activity, militate against the establishment of a dominant speech gradient. 4. The Travis hypothesis of lack of a speech gradient for stutterers is at least partially supported.

PALMER, Wichita, Kan.

A COMPARATIVE ANALYSIS OF THE RESULTS OF TESTING INDIVIDUAL HEARING AIDS IN A SCHOOL FOR THE DEAF. JEAN UTLEY and MARION GOEBEL, Speech Monogr. 10:40, 1943.

Twenty-one children from the intermediate and advanced departments of the South Carolina School for the Deaf, 14 girls and 7 boys with ages ranging from 11 to 20, with 15 congenitally deaf patients, were studied by various methods of testing audiometric results

Various hearing aids were used in order that their effectiveness might be checked. The aids are not identified in the publication. One aid was of no benefit; 1 aided the group about 14 per cent; and 1 aided about 7 per cent. Some persons who could be aided by none of the devices were helped when the loud speaker system was used. In 1 case, 1 hearing aid apparently actually decreased the ability to hear of the child who was wearing it. The general conclusion is that several aids should be tried on any severely deaf child with the use of the pure tone audiometer.

PALMER, Wichita, Kan.

Diseases of Lungs, Pleura and Mediastinum

CHYLOTHORAX IN INFANCY. GILBERT B. FORBES, J. Pediat. **25**:191 (Sept.) 1944.

An instance of bilateral spontaneous chylothorax in a 6 week old girl is described. Symptoms began at about 1 month of age and consisted of intermittent dyspnea and cyanosis. Diagnosis was made by the characteristic gross appearance and a detailed chemical analysis of the chylous fluid. There was no ascites, and the urine was normal at all times. During a two month hospital course, a total of 5,300 cc. of chyle was removed from the pleural cavities, thoracentesis being performed whenever respiratory symptoms warranted it: This was necessary on the average every thirty-six hours. The chyle contained 2.8 per cent protein and 0.4 to 1.2 per cent fat. Body protein and stores of fat could easily be depleted by the withdrawal of these large amounts; so it was necessary to combat malnutrition by feedings high in caloric value, numerous transfusions of plasma and of whole blood and several intravenous injections of the patient's own chyle. No reactions were observed after the latter procedure.

It was found that when large amounts of vitamins A and D were fed orally these substances rapidly appeared in the chyle in appreciable quantities. However, beta carotene did not appear in the chyle after oral ingestion.

After two months in the hospital the patient died from bronchopneumonia and a tension pneumothorax. At autopsy the thoracic duct could not be demonstrated, nor were there any lesions in the mediastinum which could possibly have obstructed it. With the exception of an unusual degree of insular hyperplasia of the pancreas, the remaining organs were normal.

FORBES.

A CASE OF CHYLOTHORAX IN A TWO WEEK OLD INFANT, WITH SPONTANEOUS RECOVERY. MORRIS WESSEL, J. Pediat. **25**:201 (Sept.) 1944.

A case of chylothorax in a 2 week old infant, with spontaneous recovery, is presented.

The infant, who had been born at term by a spontaneous delivery, was admitted to the Babies Hospital on the fourteenth day of life with cyanosis as the chief complaint and with labored respiration of twenty-four hours' duration. There was no history of a neonatal pathologic condition, trauma, convulsion, vomiting, infection of the upper respiratory tract or contagious exposure.

Physical examination presented a desperately sick infant, afebrile, who had acute respiratory distress with associated cyanosis. Immediate fluoroscopy revealed a dense shadow in the right side of the thorax, with marked mediastinal shift to the left. Thoracentesis in the right side of the thorax just below the angle of the scapula yielded 200 cc. of creamy yellowish fluid. Culture of the fluid proved sterile. Physical examination of the infant after aspiration showed him to be essentially normal. A diagnosis of chylothorax, cause unknown, was made.

Twelve additional aspirations were performed over a thirteen day period in order to relieve respiratory distress. Amounts between 55 and 120 cc. were obtained on the various occasions. Seven months have passed since the last aspiration, and there have been no clinical or roentgenographic signs of reaccumulation of fluid. The infant was maintained on a dietary formula high in protein and low in fat, with added vitamin concentrates.

Chemical studies on the variation of composition of the chylous fluid in relation to changes in dietary intake are reported. There is also presented a review of relevant literature.

WESSEL, New York.

OBSTRUCTIVE EMPHYSEMA DUE TO TUBERCULOUS MEDIASTINAL LYMPH GLANDS. L. G. PRAY, Pediat. **25**:253 (Sept.) 1944.

A report is presented of a 4½ month old infant with obstructive emphysema of the left lung as a result of tuberculous mediastinal glands. Physical examination and roentgenographic studies revealed changes typical of that condition. Bronchoscopy showed external pressure compressing the left main bronchus. Tracheotomy was necessary after bronchoscopy because of laryngeal obstruction. The infant died on the third day in the hospital. At autopsy there were large tracheobronchial lymph glands in the left hilar region obstructing the left main bronchus. Microscopic examination of the glands revealed typical tuberculous tissue.

PRAY, Fargo, N. D.

THE ROENTGENOLOGIC FEATURES OF MEDIASTINAL TUMORS. LAWRENCE L. ROBBINS, Radiology **43**: (Aug.) 1944.

Robbins describes and publishes roentgenograms of the chests of patients selected from 44 having primary mediastinal tumors at the Massachusetts General Hospital. Fifteen bronchogenic cysts were encountered. Their most important roentgenographic feature was a smooth, round or ovoid shadow arising anywhere within the mediastinum. Its discovery was usually accidental. All of 7 dermoid cysts were in the anterior mediastinum, only 1 being in the upper portion. The contour usually was slightly irregular. Some showed calcification in their walls. All of the teratomas (3) were located in the anterior mediastinum. Two showed slight lobulation of outline, and 1 was smooth. All were accompanied by fluid in the pleural cavity. Of 14 tumors of neurogenic origin, 9 arose in the posterior mediastinum and 5 in the anterior mediastinum. The exact nerve from which the tumor originated was difficult to determine. Only 1 tumor proved to be malignant. It was located in the right side of the middle part of the chest and was thought from its appearance to be benign. While certain diagnostic features have been demonstrated, no exact differentiation of tumors of the mediastinum was possible to the author.

ANSPACH, Chicago.

A STATISTICAL ANALYSIS OF 100,000 EXAMINATIONS OF THE CHEST BY THE PHOTOROENTGEN METHOD. PETEA ZANCA and FREDERICK K. HERPEL, Radiology **43**:122 (Aug.) 1944.

The authors' experience with the photoroentgen method, using stereoscopic 4 by 10 inch (41 by cm.) films, has convinced them that the use of

aller film is practical. These smaller single-coated ms are considered better in definition than the usual by 17 inch (36 by 43 cm.) single film of the chest. ey are recommended because of low cost and ease of ndling and processing and because they cause nimum eye strain and fatigue.

In this statistical survey, 100,000 consecutive examitions of the chests of selectees were made, using s new apparatus. Two and sixty-one hundredths of e subjects were found to have lesions of the chest.

AUSPACH, Chicago.

X CASES OF SPONTANEOUS VALVULAR PYOPNEUMOTHORAX. JOSÉ MARIA PELLIZA, Arch. argent. de pediat. **21**:518 (June) 1944.

The author reports 6 cases of spontaneous valvular opneumothorax. The importance of a correct diagsis for better management of the patient is stressed. Pleural tap is usually not advisable and, if necessary, ould be preceded by the making of anteroposterior d lateral roentgenograms.

Pleurotomy with continuous drainage is the best treatent.

CASSORLA, Chicago.

Diseases of the Gastrointestinal Tract, Liver and Peritoneum

ONG STANDING FEVER DUE TO REGIONAL ILEOCOLITIS. P. H. SPRAGUE, W. S. ANDERSON and T. R. AARON, Am. J. Digest. Dis. **11**:295 (Sept.) 1944.

Two months after having an inflammatory process the right knee, which apparently responded rapidly administration of salicylates, the patient, a 15 year l girl, had what was thought to be a polyarticular e of rheumatism. There was moderate anemia, but cept for tachycardia, the heart seemed normal. The antoux test gave negative results. Daily high temratures, varying from 100 to 104 F., continued for and one-half months, the only definite complaint ing shifting pain in the joints, particularly the knees. cept for an elevated sedimentation rate and for tenrness in the right side of the abdomen, which was ted for the first time five and one-half months after e onset of the polyarticular manifestations, all examations gave negative results until a large perianal scess developed. This was incised and drained, and e patient became afebrile. Several weeks after the scess healed it recurred, but ruptured without surcal intervention.

Three months later the patient was admitted to the spital with the same type of fever as before. A rium enema suggested an inflammatory infiltration the terminal ileum, the cecum and the ascending lon. This diagnosis was confirmed at operation, and er resection of the diseased bowel and lymph nodes side to side ileocolostomy was performed. The patnt made a good recovery and has remained well for er a year. The pathologic report was chronic ulcerae and polypoid ileocolitis, Crohn's disease.

The case is reported because of the long period of ver before any localizing manifestation was evident, d it is suggested that regional ileocolitis must be nsidered in cases of unexplained fever.

LESLIE, Evanston, Ill.

ONGENITAL ATRESIA OF THE ESOPHAGUS WITH TRACHEOESOPHAGEAL FISTULA. CAMERON HAIGHT, Ann. Surg. **120**:623 (Oct.) 1944.

In the anomaly of congenital artesia of the esophagus e upper portion of the esophagus ends as a blind pouch in almost all instances. The upper end of the lower esophageal segment usually enters the trachea, thus forming a tracheoesophageal fistula. This condition is incompatible with life, as feedings cannot enter the stomach. Furthermore, the feedings and the accumulated secretions in the blind upper segment overflow into the trachea, and death soon results from aspiration pneumonia. The author presents the anatomic and surgical problems involved in the correction of this deformity. A primary anastomosis of the upper and lower esophageal segments was done on 16 of the 24 patients for whom an exploration of the anomaly was undertaken. Six of the 16 patients for whom an anastomosis was performed were living at the time of writing (from seven months to three years and one month after operation), and the reconstructed esophagus is patent in every instance.

In the preoperative treatment the pulmonary status as regards pneumonic complications is carefully determined. From the time that a diagnosis has been made the patient is placed in a prone position with the foot of the bed elevated to favor drainage of oral secretions. A 3 to 5 per cent solution of dextrose in distilled water is given subcutaneously. Ascorbic acid and vitamin K are given routinely. Usually six to twelve hours, and seldom more than twenty-four hours, is sufficient for preoperative treatment.

If the infant was premature by more than two or three weeks or if the weight at birth was less than 4 pounds (1,814 Gm.) operation should probably not be undertaken. An extensive bilateral pneumonic consolidation is a definite contraindication to immediate operation. Other congenital anomalies usually do not contraindicate operation.

BANTIN, Omaha, Neb.

CORRELATION OF THE X-RAY DIAGNOSIS WITH THE OPERATIVE FINDINGS IN SMALL-INTESTINAL OBSTRUCTION. CLAUDE J. HUNT, Radiology **43**:107 (Aug.) 1944.

A collection of gas in the small bowel of the adult may be considered synonymous with obstruction; the typical transverse pattern is not a necessary sign. Gas in small children is of no diagnostic significance. In simple obstruction the distribution of the gas may be centrally located, with a transverse long axis. In loop obstruction this is not true. A stepladder appearance indicates advanced obstruction. In postoperative distention a mechanical factor or ileus may be the causative factor. With the former, only the small bowel is distended; with the latter both the small and the large bowel are distended.

Obstruction due to inflammatory lesions within the abdomen, volvulus, intussusception and external strangulation are briefly discussed. The author states that although the Miller-Abbott tube has fallen into disrepute, he believes it can be used profitably in the treatment of simple adhesive obstruction and for preoperative decompression.

ANSPACH, Chicago.

THE ROENTGEN DIAGNOSIS OF HYPERTROPHIC PYLORIC STENOSIS IN INFANTS. H. W. HEFKE, Radiology **43**:267 (Sept.) 1944.

The author emphasizes as a sign of pyloric stenosis the narrowed prepyloric canal described previously by Meuwissen and Sloof (1932). He considers it the only entirely reliable roentgen finding.

Of 150 infants examined for pyloric stenosis at the Milwaukee Children's Hospital, 68 were operated on after a roentgenographic diagnosis of pyloric stenosis. In all tumors were found.

The author believes that the most important roentgenographic sign is the actual demonstration of the narrowed prepyloric canal by either fluoroscopic examination or roentgenograms. In about 50 per cent of the patients this could not be made out with the fluoroscope. For others who were seen eventually, it was necessary to take several roentgenograms, requiring up to an hour. By this method of repeated examination, the narrowed canal of the pylorus or a part of the duodenal cap could be seen on at least one film, and usually on more than one. The position for the taking of the film was determined with the fluoroscope.

ANSPACH, Chicago.

TWO CASES OF GONOCOCCIC PERITONITIS IN CHILDREN. CARLOS ALBERTO CHAVES DE ARUJO, Pediat. e Puericult., Bahia **13**:56 (Sept.) 1943.

Two patients with gonococcic peritonitis were successfully treated by therapy with sulfonamide compounds over a period of five days.

DWYER, Kansas City, Mo.

DIVERTICULA OF MECKEL. EINAR EDBERG, Svenska läk.-tidning. **40**:2958 (Dec. 17) 1943.

This is a report on 26 patients (16 boys and 10 girls) with Meckel's diverticula. In 5 of them this finding was incidental, at laparotomy for other diseases. Two patients had an open diverticulum at the umbilicus. One of these patients died; the other was discharged healthy. Melena due to ulceration of the mucosa of the diverticulum occurred in 3 patients, who were successfully operated on. In 5 patients there was diverticulitis with signs and symptoms of appendicitis, with a fatal outcome in 1 patient. One patient had Meckel's diverticulum with interocystoma; 5, of whom 2 died, had ileus ex strangulatio; 4 had a diverticulum with intussusception, and 1 had a diverticulum perforated by a fishbone.

WALLGREN, Stockholm, Sweden.

Nervous Diseases

DIFFUSE MENINGEAL SARCOMA. ANTONIO ROTTINO and ROBERT POPPITI, J. Neuropath. & Exper. Neurol. **2**:190 (April) 1943.

A girl aged 10 years, with one year's history of symptoms and with neurologic evidence of an expanding lesion of the right parietal lobe, suddenly became comatose and died. Gross examination of the brain revealed a thick, plaquelike, nonencapsulated tumor occupying the leptomeninges and the cortex of the dorsolateral surface of the right parietal lobe and adherent to the overlying dura.

Microscopic examination of the tumor revealed that the type and arrangement of the cells were characteristic of meningioma, but in some areas multinucleated giant cells and abundant mitotic figures justified the diagnosis of meningeal sarcoma. Most notable was the fact that numerous columns of cells from the under surface of the neoplasm penetrated the cortex along the course of the blood vessels. The tumor was thickest centrally, where the brain was massively infiltrated. At its periphery the meningeal growth gradually thinned, to become confined to the pia-arachnoid. Elsewhere in the meninges there were focal areas of solid membrane.

The author believes that this case of a malignant meningeal tumor gives support to the opinion expressed by Globus that "in certain conditions, the meninges covering the brain may retain their premature arrangement after birth," and to Weinberger's theory that "the presence of such sheets of undifferentiated tissue would a priori provide a source for future tumor formation."

CAMPBELL, New York.
[ARCH. NEUROL. & PSYCHIAT.]

A COMPARATIVE STUDY OF LOUDNESS, PITCH, RATE, RHYTHM AND QUALITY OF THE SPEECH OF CHILDREN HANDICAPPED BY CEREBRAL PALSY. BERNICE R. RUTHERFORD, J. Speech Disorders **9**:263, 194

A group of 48 children with the extrapyramidal ty of cerebral palsy and a group of 74 with the pyramid or spastic, type were controlled against a group of children without cerebral palsy for the quality, loudne pitch, rate and rhythm of the voice. Three judges ra the patients on these points. There was little eviden that there is a sharply defined type of speech chara teristic of these children. The range of individu differences was wider than that of likenesses. T term characteristic spastic speech should not be us The children with the two types of cerebral pal differed in rate and rhythm trends as to the proporti of voices which were loud, low pitched, monotonous breathy. The group with the extrapyramidal type cerebral palsy tended toward slower, more jerky spee The group with the pyramidal type of cerebral pal contained more loud voices, more low-pitched voices a more monotonous voices. The differences seemed to related to the control of the breathing apparatus. D ferential therapy for patients with cerebral palsy m be based on individual needs.

PALMER, Wichita, Kans.

FAMILIAL CEREBRAL DEGENERATION WITH CORTIC ATROPHY. H. M. KEITH, Proc. Staff Meet., Ma Clin. **18**:499 (Dec. 15) 1943.

Keith performed encephalographic studies on 2 infa siblings. Gross encephalic abnormalities were observe therefore a diagnosis of diffuse cortical atrophy w progressive mental retardation was made for bo infants.

GUTTMAN, New York.
[ARCH. NEUROL. & PSYCHIAT.]

CEREBROSPINAL FLUID PROTEIN AND INTRACRANI TUMORS. G. PHILLIPS and G. GOSWELL, M. J. Au tralia **1**:390 (April 29) 1944.

The incidence of increase in the amount of protein the cerebrospinal fluid in a series of 161 cases of intr cranial tumor was 26 per cent. In search of an e planation of the wide range in percentage of increa reported by other investigators the authors' cases w analyzed with respect to type of tumor cell, to situati and such associated factors as increased intracran pressure, to vascularity and to direct contact of ne plastic tissue with the circulating ventricular or cer brospinal fluid.

The only group of tumors in contact with the su arachnoid fluid which produced a constant increase the level of protein was the cerebellopontile ang tumors growing from the eighth nerve. There appear to be no direct relation between the cell type, per and increase in the level of protein. Neither did the appear to be any direct relation between increased tracranial pressure or duration of increased pressu and overproduction of protein. Vascularity and necro of the tumor in the absence of frank hemorrhage d not materially influence the protein content of the su arachnoid fluid.

Although almost any type of intracranial tumor in any situation may raise the level of protein in the cerebrospinal fluid, the authors' experience was that this change seldom took place unless the growth was found either in the region of the sylvian fissure or in the cerebellopontile angle. Lateral shift either of the ventricles with supratentorial tumors or of the brain stem with angle tumors was constantly associated with an increased level of protein in the subarachnoid fluid.

GONCE, Madison, Wis.

CONTRIBUTION TO THE STUDY OF SPASMUS NUTANS IN INFANCY. LORENZO EXPÓSITO MARTÍNEZ and HUGO GONZÁLEZ DÍAZ, Bol. Soc. cubana de pediat. **15**: 620 (Sept.) 1943.

The authors carefully studied this psychomotor disturbance, which contributes, in their opinion, to more serious nervous disorders developing later in life. The symptom complex is defined and Cruchet's classification outlined in detail. The authors state that spasmus nutans may be a symptom of epilepsy, brain tumor, cerebellar tumor, tuberculous meningitis, tetany, encephalitis, hydrocephalus or acute toxic infections; it also occurs as a reflex during dentition and in intestinal parasitism.

In connection with the etiology of the disease 6 cases are discussed. Expósito Martínez and González Díaz believe in the presence of an anatomic substratum that disappears in most of the cases with the evolution of the nervous system.

KEITH, Rochester, Minn.

Psychology and Psychiatry

SEX DIFFERENCES IN SOCIAL SUCCESS AND PERSONALITY TRAITS. MERL E. BONNEY, Child Development **15**: 63 (March) 1944.

Social success in three groups of fourth grade children was determined by choices made by the pupils. Ratings on personal traits were obtained from pupils and teachers, and self ratings were obtained by the use of the "California Test of Personality, Elementary Form AA."

On the whole, sex differences in social success and personal traits were not found to be large, but there was a high degree of consistency in favor of girls on both kinds of measurements. In only two traits were highly reliable sex differences found. These traits were restlessness and pugnacity, and the boys had the higher scores. These two traits were also the only ones in which the most popular boys had reliably higher averages than the most popular girls. Also on the basis of ratings by teachers, taken separately from ratings by the pupils, the boys were given a 14 per cent higher average than the girls in "fighting." The ratings by teachers gave the girls much higher averages in being tidy, good looking and grownup. On the California Test for Personality the girls had a higher mean score on total adjustment and on all subdivisions of the scale except two, but complete statistical reliability was found on only one part of the test. This was on "social skills," and the advantage was with the girls.

Some relationships between the facts or tendencies observed and the education of boys and girls were pointed out.

EARLY INFANTILE AUTISM. LEO KANNER, J. Pediat. **25**:211 (Sept.) 1944.

This paper reports a study of 20 children (16 boys and 4 girls) who showed features of extreme autistic aloneness from earliest infancy. All of them came from highly intelligent families. The first thing that the parents of such children notice is the absence of any sort of affective contact. Even within the first few months of life the children fail to show the usual anticipatory reactions to being picked up and the usual adaptation of the body to the person who picks them up. As these children grow older, they become interested in objects which they can handle adequately, but for a long time have no relation whatever to human beings. People are treated as if they were not there, and the children deal with other people's hands or legs as if they were detached objects not related to the people themselves. Some of the children acquire excellent vocabularies, but the words used have no communicative value. When sentences are formed, they are almost exclusively echolalia-like repetitions of things said to them. This results in a peculiar use of pronouns, in that the children speak of themselves as *you* and of other people as *I*. The children are all extremely obsessive, and their excellent rote memory makes them appear at first as child prodigies.

As time goes on most of the children are able to form some degree of compromise with outer reality, learning to carry on a conversation, but they always return to their obsessiveness and aloneness.

The parents are usually people who are much more interested in abstractions than in practical dealings with other human beings; they also show a great deal of obsessiveness.

KANNER, Baltimore.

AN EXPERIMENTAL EVALUATION OF SUGGESTION RELAXATION. RAYMOND CARHART, Speech Monogr. **10**:29, 1943.

Ninety students, 30 men and 60 women, were tested for their palmar resistance on an improved Darrow behavior research box. The subjects were divided into three groups. One group was not instructed to relax; the second group was told to relax without any further instructions, and the third was given detailed instructions on how to relax. There was no sex differentiation in the results. Telling the subjects to lie quietly or simply telling them to relax produced greater relaxation than did the suggestion method. In fact, tensions actually increased under suggestion. During the moment of giving instructions in relaxation, there was increase in tension. Subjects who were requested to speak during the experiment showed immediate increased tension. Subjects who were silent did not show this change.

PALMER, Wichita, Kan.

ACUTE SCHIZOPHRENIA IN CHILDHOOD: REPORT OF A CASE. LOUISE F. W. EICKHOFF, Edinburgh M. J. **51**:201 (April) 1944.

Because of the difficulty of a differential diagnosis, a rare case of acute schizophrenia in childhood, which had formerly been regarded and managed as mental deficiency, is presented. The diagnosis of acute schizophrenia is considered from three viewpoints: the previous history, the clinical picture and the result of the intelligence test. All three sets of data are considered valuable aids in diagnosis. A distinction is made between the moron, who responds to encouragement, and the schizophreniac, who does not, but who does show improvement on immediate retesting. It is important that an early diagnosis be made so that early relief can be given by psychiatric means and a proper emotional adjustment may be made.

NEFF, Kansas City, Mo.

Diseases of the Ductless Glands; Endocrinology

ALLOXAN DIABETES IN THE DOG. M. G. GOLDNER and G. GOMORI, Endocrinology **33**:297 (Nov.) 1943.

Experimental diabetes mellitus in dogs has been produced by pancreatectomy and by treatment with anterior pituitary extract. A third, or chemical, type of diabetes may be produced by injection of alloxan (mesoxalyl urea), which has a specific necrosing action on both the pancreatic islet cells and the epithelium of the renal convoluted tubules.

Alloxan diabetes in dogs is characterized by prompt onset of hyperglycemia and glycosuria, within twenty-four to forty-eight hours, sometimes preceded by a short period of hypoglycemia if doses of 75 to 100 mg. per kilogram are given, and later development of hyperlipemia and fatty degeneration of the liver, within ten to twelve days. It differs from anterior pituitary diabetes in that a single injection suffices to produce permanent diabetes and the animals remain sensitive to insulin.

The extremely high levels of blood sugar observed after the administration of doses of 75 to 100 mg. per kilogram suggest that alloxan exerts its diabetogenic action not only through necrosis of the insulin-producing islet cells but by direct effect on the parenchyma of the liver. In totally depancreatized dogs the blood sugar seldom reaches such high values.

Intravenous administration of alloxan to dogs in a single dose exceeding 100 mg. per kilogram caused death of the animals within a few hours. A dose between 75 and 100 mg. per kilogram produced a diabetic-uremic syndrome of which the animals died within one week. A dose of 50 to 75 mg. per kilogram produced typical diabetes without renal lesions. Animals given this amount of alloxan could be kept alive for weeks. The main histologic features of the diabetes produced by alloxan were disappearance of the beta cells from the islets, profound vacuolation of the epithelium of pancreatic ducts and fatty changes in the liver. Doses of 25 mg. per kilogram were without effect.

JACOBSEN, Buffalo.

THE TREATMENT OF HYPERTHYROIDISM IN CHILDREN. C. BERKELEY MCINTOSH, J. Pediat. **25**:133 (Aug.) 1944.

Hyperthyroidism in children tends to be a self-limited disease. In spite of this fact, surgical procedure has been the preferred method of treatment for the last twenty years. In recent years, however, some clinicians have been questioning whether thyroidectomy is the best treatment for all children with hyperthyroidism. Dr. W. A. Reilly, of the University of California Medical School, reported in 1940 that about half of his series of 62 patients obtained complete arrest of their disease without surgical intervention.

Of 23 children with hyperthyroidism treated at the University Hospital since 1925, 19 were subjected to subtotal thyroidectomies, and 4 were treated without surgical procedure. The operations resulted in 9 complete arrests, 3 nearly complete arrests, 5 recurrences and 2 deaths. The patients not subjected to operation were all successfully treated by conservative management. The conclusions drawn from this study are that in treating children with hyperthyroidism an adequate trial of medical management should be made before surgical intervention is advised and that for a considerable number of these children operation does not become necessary or desirable. AUTHOR'S SUMMARY.

Diseases of the Muscles, Bones, Joints and Lymph Glands

A COMPARATIVE STUDY OF MUSCLE ATROPHIES CAUS BY DENERVATION AND ACUTE INANITION. H. HINES, J. D. THOMSON and B. LAZERE, Am. Physiol. **140**:115 (Oct.) 1943.

A comparative study of the atrophies due to ac inanition and denervation in the tibial nerves and ga trocnemius muscles of albino rats was made by t authors. They found no evidence that prolonged ac inanition resulted in "functional denervation" of skele muscle. They observed that the muscles of fast animals did not exhibit characteristics typical of d nervation atrophy, such as the presence of fibrilla activity and the contracture response to injections acetylcholine. The ratio of the tension elicited by ner stimulation to that elicited by direct muscle stimulati was the same in fasting as in well nourished anima The regenerating nerve fibers of fasting animals we able to make functional contacts with muscle units qu as effectively as those of well nourished animals.

STOESSER, Minneapolis.

MYASTHENIA GRAVIS—ITS OCCURRENCE IN A SEV YEAR OLD FEMALE CHILD. MELVIN D. YAHR a THOMAS K. DAVIS, J. Pediat. **25**:218 (Sept.) 19

The authors report the myasthenia gravis syndro in a young child showing generalized weakness a variable bilateral ptosis. This child was first studi in June 1943, when she was 7 years old, but it wou appear that abnormal weakness began much earli possibly as early as 14 months. The blood count w within normal limits. The Wassermann and Kline te of the blood gave negative results. The fasting blo sugar was 93 mg. There were no abnormal findin in the urine. Urinary excretion of creatine was n determined. Roentgenographic examination showed evidence of thymic enlargement. Chromaxic studies the muscles of the face and of the sternocleidomasto muscles gave results within normal range. Tests wi the faradic current before and after intramuscular a ministration of neostigmine methylsulfate gave resul characteristic of myasthenia gravis. Also the spee test of Viets and Schwab was positive: Without ne stigmine the child could count to 25; after injection neostigmine methylsulfate (0.75 mg.) she counted w above 100.

This patient showed coincidental defective intelligen On the revised Stanford-Binet form L, the intelligen quotient was 44.

The patient at the time of writing was showing sati factory therapeutic response to a daily dose of 22 m of neostigmine bromide given orally, supplemented b 0.75 mg. of neostigmine methylsulfate given intramu cularly every other day. YAHR.

OSTEOSARCOMA IN INFANCY. CARLOS DA GAMA, Pedia e puericult. Bahia **13**:49 (Sept.) 1943.

Bilateral and symmetric osteosarcoma of the kn of a child aged 10 years is described. The differenti diagnosis in the early stages among bone cysts, whi tumor and osteomyelitis is discussed. Osteosarcom tends to affect long bones at the epiphysis: The low part of the femur and the upper part of the tibia a frequent sites. DWYER, Kansas City, Mo.

ASE OF BOECK'S SARCOID. ANNIE SCHONDEL, Nord. med. (Hospitalstid.) **17**:258 (Feb. 13) 1943.

A boy of 2½ years had previously been healthy, but e year before he was seen by the author he had ellings and tenderness in his fingers that persisted. t the examination the second phalanges of the second d third fingers of the right hand and of the third ger of the left hand showed distinct swelling without derness. The toes were normal. Slightly enlarged mph nodes were present in the neck. The internal gans appeared normal under roentgen examination. e tuberculin test gave a negative result. The sedi- entation rate of the blood was 5 mm. White cells mbered 12,240, with 51 per cent lymphocytes. Roent- nograms showed disseminated small defects in the fected phalanges, rather typical of Boeck's disease.

WALLGREN, Stockholm, Sweden.

Diseases of the Eye

IATHERMY COAGULATION IN THE TREATMENT OF ANGIOMATOSIS RETINAE AND OF JUVENILE COATS'S DISEASE: REPORT OF TWO CASES. J. S. GUYTON and F. H. MCGOVERN, Am. J. Ophth. **26**:675 (July) 1943.

The authors report a case of bilateral angiomatosis tinae in which diathermy coagulation gave gratifying sults and a case of juvenile Coats's disease in which athermy treatment apparently checked the progress the disease.

In the first case, of early angiomatosis retinae of the ght eye and advanced angiomatosis retinae of the left e, the angiomatous masses were obliterated by dia- ermy coagulation. The sites of the angiomatous asses became scars, and the dilated retinal vessels re reduced in size. Vision was completely preserved the right eye, and the ophthalmoscopic appearance of e left eye improved, although vision was not regained.

In the second case, of early juvenile Coats's disease the right eye and complete blindness of the left eye, e to massive exudative retinitis, the left eye was ucleated because of early phthisis. Histologic ex- mination of this eye showed a few areas of capillary roliferation in the retinal lesions, somewhat suggestive angiomatosis retinae. The primary peripheral lesion the retina of the right eye, which had steadily pro- ressed in size for eleven months, was obliterated with athermy punctures. The site of the peripheral lesion came a scar; edema of the disk and a subretinal exu- te below the disk disappeared, and vision was com- etely preserved.

ZENTMAYER, Philadelphia. [ARCH. OPHTH.]

EUROMYELITIS OPTICA. JOSEPH F. SIEGEL, J. Pediat. **25**:328 (Oct.) 1944.

An instance of paraplegia associated with bilateral ptic neuritis is reported with the clinical diagnosis of euromyelitis optica.

A clinicopathologic discussion of neuromyelitis optica presented, attention being called to its clinical simi- rity to other demyelinating diseases of the nervous ystem.

An attempt is made to differentiate neuromyelitis ptica clinically from allied disorders.

AUTHOR'S SUMMARY.

Skin Diseases; Allergy

A RAPID TREATMENT FOR SCABIES. ALBERT H. SLEPYAN, J. A. M. A. **124**:1127 (April 15) 1944.

Slepyan treated 189 persons with scabies with benzyl benzoate and followed them for more than fourteen days. No recurrences were noted. Two patients concurrently infected with pediculosis pubis were also cured of their pediculosis by the scabicide.

HENSCHEL, Denver. [ARCH. DERMAT. & SYPH.]

CAUSE AND TREATMENT OF FURUNCULOSIS. PHILIP B. PRICE, J. A. M. A. **124**:1189 (April 22) 1944.

Price believes that a local spread of infection is sufficient to account not only for the features of furunculosis but for its characteristic chronicity. It is his opinion that the usual mode of spread of infection in furunculosis is by discharges, sweat, bathing and friction, which smear the pathogenic organisms over the surface of the skin.

He recommends that an attempt be made to sterilize the skin of the whole contaminated region. Healthy skin can be thoroughly degermed with exactly 70 per cent ethyl alcohol. Price washes the involved area for from twenty to thirty minutes with the alcohol. The optimum time to employ this treatment is in the interval between the healing of one furuncle and the onset of the next. Eleven patients with furunculosis so treated had prompt and permanent relief.

HENSCHEL, Denver.
[ARCH. DERMAT. & SYPH.]

HUMAN DANDER: AN IMPORTANT CAUSE OF INFANTILE ECZEMA. FRANK A. SIMON, J. A. M. A. **125**:350 (June 3) 1944.

Patch tests with human dander elicited positive reactions in 15 of 20 infants and young children with eczema. In 23 noneczematous controls only 1 positive reaction to the patch test was elicited. Prompt clinical improvement appeared in 3 of 4 patients with infantile eczema after institution of measures directed at the avoidance of contact with human dander. In all 4 of them typical eczematous areas were produced on a previously uninvolved area of skin when the mother was instructed to rub her hair on the child's abdomen for two or three minutes twice daily.

HENSCHEL, Denver. [ARCH. DERMAT. & SYPH.]

THE CAUSES OF HAY FEVER OCCURRING BETWEEN THE GRASS AND RAGWEED SEASONS. ROBERT CHOBOT and HAROLD D. DUNDY, J. Allergy **15**:182 (May) 1944.

Chobot stresses the importance of learning what pollens may be present in the air in the preragweed season. If present, even in small quantities, there are a few patients who will be benefited by the addition of a small amount of the extract to the ragweed extract. Sensitivity to the pollen as demonstrated by a skin test is not the only requisite: The patient should be observed during the season to exclude other causative factors.

HOYER, Cincinnati.

A CONSIDERATION OF SOME ALLERGY PROBLEMS. ROBERT A. COOKE, J. Allergy **15**:203 (May) 1944.

This article deals with the problem of allergic dermatitis intelligently and with common sense and candor. The author's conclusions should be helpful in treating the conditions discussed:

Neurodermatitis of older children and adults is only chronic eczema and should be so called.

Contact type eczematous dermatitis is an allergy. Eczema of adults, children and infants, the so-called atopic dermatitis, is also an allergy. The two conditions are immunologically identical.

The method by which contact is established, whether external or internal, is inconsequential. The type of substance, whether protein, oil, resin or complex organic chemical (so long as it is not a primary irritant), is immaterial also.

Patch tests and clinical tests by exposure to the antigen are the only methods available today for etiologic diagnosis.

Since sensitization of the skin is not always general, care must be taken to apply the patch to an area that has been the site of a lesion.

Intradermal or scratch tests must be discarded as diagnostic procedures for eczema, and the terms atopic dermatitis and neurodermatitis should be eliminated from the nomenclature.

HOYER, Cincinnati.

CLINICAL EVALUATION OF ASCORBIC ACID IN THE TREATMENT OF HAY FEVER. SELIAN HEBALD, J. Allergy **15**:236 (May) 1944.

Ten patients with hay fever were treated with 250 mg. of ascorbic acid twice a day for a period of four to five weeks during the season of 1943. Definite improvement was shown in only 2 of the cases. No laboratory work was done. HOYER, Cincinnati.

DEATHS FROM ASTHMA. FRANCIS M. RACKEMANN, J. Allergy **15**:249 (July) 1944.

The reports at autopsy on 50 of his own cases of asthma and cases of asthma collected from the literature are reviewed. The patients in 82 of these cases died because of asthma. Most of the deaths occurred after the age of 45, but the typical symptoms and pathologic changes occur in younger persons.

Death from asthma is caused by the development of tough, sticky mucus plugs, which obstruct the bronchi and cause suffocation.

The pathologic picture is characterized by voluminous, distended lungs of bluish gray color, and the cut section shows all bronchi occluded by plugs.

HOYER, Cincinnati.

THE USE OF STRAINED MEATS AS THE PROTEIN BASIS FOR MILK SUBSTITUTES IN THE TREATMENT OF MILK ALLERGY. JEROME CLASER, J. Allergy **15**:283 (July) 1944.

Three children with infantile eczema showed improvement with the use of a formula with strained meat as its base. The children had shown no improvement with the use of other milk substitutes. Unfortunately the food that was used is not available commercially. Its composition and the method of its preparation are, however, given in detail. HOYER, Cincinnati.

ERYTHEMA NODOSUM IN CHILDREN. EDITH M. LINCOLN, JANET ALTERMAN and HYMAN BAKST, J. Pediat. **25**:311 (Oct.) 1944.

The total number of cases of erythema nodosum encountered in three large hospital services in the United States is small compared with the numbers reported from northern continental Europe. In the majority of adolescent and adult patients seen in Boston and New York the eruption would seem to be due to infections other than tuberculosis. In the series reported from the children's ward of Bellevue Hospital, New York, 74 per cent of the children with erythe nodosum reacted positively to the tuberculin test, th to four times the normal incidence, although in o 39 per cent of the cases could tuberculosis be cons ered definitely responsible for the erythema nodosu Of 362 patients over 2 years old with active prima tuberculosis, erythema nodosum occurred in 3.6 cent. The symptom complex of erythema nodos developed concomitantly with the primary tubercul in 2.7 per cent of the cases. It is possible that apparent contradiction in medical literature concern the causation of erythema nodosum may be due to describing of groups of patients of varying ages. authors of the present article conclude that every ch with erythema nodosum should be regarded as pot tially tuberculous, but that no child should be fina considered tuberculous without a complete study; t when erythema nodosum occurs in children with act tuberculosis it is commonly associated with the ea phases of the disease and that erythema nodosum m be an important aid in the diagnosis of tuberculosis an individual case. In the United States the condit occurs so uncommonly that its usefulness as a di nostic aid is much less than in northern Europe.

AUTHORS' SUMMARY.

CONGENITAL, HEREDITARY LYMPHEDEMA (MILRO DISEASE). KURT GLASER, J. Pediat. **25**:337 (Oc 1944.

The author describes 2 cases of Milroy's dise observed at the Milwaukee Children's Hospital a gives a brief review of the entire subject, includi the high lights of the literature.

A disease most likely Milroy's disease was fi described by J. Hille, in Germany about the middle the last century, and was again described by Mil in 1890 in the United States. Osler gave it the na Milroy's disease. In 1928, after thirty-five years observation, Milroy himself published a report ab the same family he had described in 1892 and discus the condition in general.

The condition is defined as congenital, heredita edema without tenderness or painfulness and with constitutional symptoms. It is of rare occurrence usually affects several members of the same fami The cause is unknown, and several theories have b suggested. The symptom is pitting edema of one both legs, never extending above Poupart's ligame There are no significant laboratory findings. T pathologic-microscopic manifestations are enlarg lymph spaces with increase in the surrounding fibro tissue. The course is chronic and progressive. T treatment is palliative. It consists of applying press bandages to prevent further swelling.

A white boy aged 4 years at the time of this rep and his sister, one year younger, are described. B children had had swelling of the feet since birth. T extent of the swelling varied, being influenced to slight degree by the amount of exercise and by t application of pressure. The boy showed a mark swelling of the prepuce, which was remedied by c cumcision.

Complete laboratory study of the urine, the che istry of the blood (chlorides, nonprotein nitrog cholesterol, calcium, phosphorus, phosphatase, to protein and albumin and globulin) and the serolo of the blood, as well as the wheal absorption test, ga normal results.

Roentgenographic studies showed normal formati of bones in both children. Microscopic examinati of the boy's foreskin revealed large structures resc

ing lymphatics and dense collagen fibers, a picture pical of the condition as described by other authors. The treatment consisted of application of bandages different types, all with the purpose of reducing the mount of edema by pressure. The result was, as was pected, only slight and of temporary value.

The paper reports 2 typical cases of Milroy's disease, monstrating the absence of a causative constitutional sorder. It describes the histologic changes in this ndition, throwing some light on the theories of causa-on. Two photographs show the edema of the legs.

GLASER, Milwaukee.

SEUDOERYTHEMA NODOSUM DUE TO SULFATHIAZOLE THERAPY. RAUL CIBILS AGUIRRE, JULIO R. CALCARONI and JULIO A. TAHIER, Arch. argent. de pediat. **20**:468 (Dec.) 1943.

In 4 children treated with sulfathiazole an eruption sembling erythema nodosum developed. The dose of lfathiazole administered varied from 0.1 to 0.2 Gm. r kilogram of body weight. The eruption was easily stinguished from erythema nodosum because the dules were smaller and more pallid. Lack of spon-neous pain was characteristic, as was lack of pain palpation. The eruption had a tendency to spread t only on the extremities but over the entire surface the body. The differential diagnosis was established the basis of the fact that the lesions appeared be-een the second and tenth days of treatment with lfathiazole and the transient evolution of the con-ion. The rash reappeared when the treatment was rted again (in 2 cases out of 3). Obviously the lack history of tuberculosis and the negative reactions to berculin were helpful. The impression of the authors that the prognosis of this condition is favorable. tients were treated with forcing of fluids and with-awal of the drug. CASSORLA, San Francisco.

ALLERGY OF THE CHILD. JOSÉ J. PEDRERA, Bol. Soc. cubana de pediat. **15**:600 (Sept.) 1943.

The article presents a rather complete review of the problem, of allergy in children, starting with the definition and discussing the relation to anaphylaxis, the nature of the allergic phenomenon, the different offenders, such as drugs, food, bacteria and so forth, and also the variations according to localization of shock tissue in different organs—respiratory (asthma), skin (eczema) and so forth. Also mentioned is the eczema-prurigo-asthma syndrome described by Rash, as well as the anaphylactic shock of acute onset following ingestion of food, with vomiting, severe abdominal cramps, diarrhea, circulatory collapse and even death as described by Finkelstein. Other symptom complexes are discussed, e. g., gastric disorder, mucus colitis, angioneurotic edema, toxemic allergy with predominantly nervous symptoms, etc. The importance in etiologic diagnosis of a detailed history is pointed out.

KEITH, Rochester, Minn.

Miscellaneous

THE STERNOMASTOID SIGN. A. W. BRANWOOD, Edinburgh M. J. **51**:152 (March) 1944.

The author cites R. R. Trail as the first to describe the sternomastoid sign in a discussion of the early diagnosis of tuberculosis in *Lancet* for 1942.

To bring out this sign, the patient's head is supported, and he is told to look straight to the front. A positive sign consists of tenseness of the tendinous portion of the sternomastoid muscle on one side greater than that of its fellow. The significance of the sign is that it denotes displacement of the mediastinum to the side on which the tenseness is found. Branwood cites cases, in 2 of which the patients were children. He feels that this sign may be helpful. NEFF, Kansas City, Mo.

Book Reviews

Mitchell's Pediatrics and Pediatric Nursing. Revised by Robert A. Lyon, M.D., and Winifred Kaltenbach, B.A., R.N. Price, $3.00. Pp. 504, with 97 figures and 32 tables. Philadelphia: W. B. Saunders Company, 1944.

The opening chapter of this book depicts the evolution which preceded the refinements of technic in present day methods of care of children. The student learns that children require protection and guidance in order to develop into well and useful citizens. In achieving that goal the nurse has a privileged role to fill.

Physical growth and development, mental, nervous and emotional development and mental hygiene are presented in chapters 2, 3 and 4. The adult's attitude is rightly emphasized, since it is of major importance in the life of a child.

In chapters 5, 6 and 7 the subject of nutrition is covered adequately. The subject of abnormalities of nutrition, which in the 1939 edition was placed under nutrition, now appears under diseases and abnormalities, which is an improvement.

The chapter on children in the home acquaints the student with the child's life in his usual surroundings and describes the adjustments necessary in the home when the child is ill.

Eighty pages are devoted to children in the hospital. Desirable approaches to and management of the child, therapeutic procedures and diagnostic procedures are well presented. Setting up the details of technical procedures is the task of the instructor of pediatric nursing in each school. Throughout these pages there are valuable hints and suggestions for caring for the sick child. In a few instances sketches would be a better medium than photographs to depict equipment.

The subject of abnormalities and diseases is presented in an orderly manner, proceeding from pathologic conditions in premature and other newborn infants through abnormalities in nutrition to the diseases involving the various systems of the body. Throughout the 247 pages devoted to this subject there are numerous pictures and tables. The photographs of rashes, however, have lost their value through not being in color. The tables and diagrams are excellent and will aid the student materially.

A description of the child in the community is pertinent. The functions of a health department are explained, and graphs and tables show the causes of death in various age groups. Institutions and agencies that substitute for parents in caring for the child are discussed thoroughly.

There is an appendix replete with needed information, well tabulated and arranged for ready reference.

This book is readable and practical, and throughout its pages the reader feels a fine regard for the child. No one will close the book without realizing the necessity for the care of children and the dire need of adequate instruction in health, especially for prospective parents.

The text is good and is supplied with ample biblio raphies. The subjects treated by the curriculum gu for schools of nursing in the five units of instructi under the nursing care of children are adequately co ered in the arrangement in six units by the pres authors. Sections of the text will be of help to pare Public health nurses and private duty nurses co well use it for reference. A review of this book medical students will enable them to adapt themsel more readily to children in the hospital.

Small Community Hospitals. By Henry J. Sou mayd and Geddes Smith. Price $2.00. Pp. 1 with no illustrations. New York: The Commo wealth Fund, 1944.

If there are any authorities on rural or commun hospitals the Commonwealth Fund should qualify one of them, for it has assisted in the building of such hospitals in the United States. It is with t experience and with the problem faced by smaller co munities that this book deals. Although there has b a rapid growth in the number of small hospitals, t growth will without doubt increase in the future.

The actual physical plant of the hospital prese only a small part of the problem that a commun must consider. First, the needs of the community m be studied; second, an adequate and cooperative me cal staff must be organized, and, third, a sound fin cial basis must be established. Only when th preliminary steps have been taken can the physi plant of the hospital and its administration be co sidered.

The authors deal intelligently with all these proble as they have met them in the field. From this expe ence they point out how the minimum standards up by the American College of Surgeons can be m There are chapters on the rural hospital as a co munity institution, the rural hospital and the medi team, organization and administration, hospital financ the hospital plant and the hospital and the countrysi

Although this book is primarily for the nonprofi sional person, medical students and physicians in pr tice should read it to obtain a better understandi of the problems and responsibilities of hospitals la and small. "The modern community hospital un voluntary auspices is a middle of the road merger the charity institution and a private facility. It s services when it can to patients who are willing a able to pay, and gives service—at community expe —to those who cannot pay."

All About Feeding Children. By Milton J. E. Se M.D., and Phyllis Krafft Newill. Price, $2 Pp. 269, with 1 table. New York: Doubled Doran and Company, 1944.

At long last here is a book for mothers, written a pleasing style, that covers meticulously all the eve day problems of nutrition from birth to adolesce The authors offer their book as a supplement to

vice of the attending physician, thereby relieving
m from the duty of giving time-consuming individual
rbal instructions on preparations of food, the technic
feeding and the psychologic approach to new foods.
The title, "All About Feeding Children," is well
stified. The authors discuss in detail every phase of
hat, when and how to feed infants and the other
embers of the younger generation.
The chapter on the breast-fed baby is commendable.
states that the pendulum is swinging back so that
others now take pride in nursing their babies as
ture intended they should. This chapter is full of
od common sense and strongly urges every mother
nurse her baby if possible. This advice for nursing
others, plus the technic for establishing and maintain-
g milk supply, should be available to every mother
fore she leaves the hospital.
The suggestions and directions on the bottle-fed
fant and the chapter on preparing special formulas
e most complete. The latter half of the book, oddly
ough, might be described as the first real cookbook
clusively for children.
The authors approach the psychologic aspects of feed-
g children in the sympathetic modern way. They are
stinctly liberal and broad minded and avoid contro-
rsial subjects.
No medical advice is given, and they warn against
escribing at home and against accepting advice from
y one except the physician in charge. They con-
mn the hit and miss giving of vitamins and minerals.
In the chapter on the so-called dysfunctions asso-
ted with eating the authors consider all the minor
nesses, ailments and idiosyncrasies in connection with
lty diets, incorrect handling and preparing of foods
d wrong eating habits. Here they again emphasize
e necessity for direct supervision by a physician in
but the mildest conditions. They discuss colic,
nstipation, diarrhea, vomiting, hiccups, allergy, ano-
xia and thumb sucking. Many of the common points
hich the authors bring out are not so well known
all members of the medical profession, but that they
ld derive benefit from reading this chapter.
This book, being a work of reference, has an excel-
t index and a glossary of the terms usually left
explained to mothers.
The book may be recommended unreservedly to all
others and to physicians.

uttering: Significant Theories and Therapies. By Dr. Eugene F. Hahn. Price, $2. Pp. 177, no illustrations. Stanford University: Stanford University Press, 1943.

This volume is a summary of the views of eighteen nerican and seven European authorities on stuttering. Its purpose is to facilitate study of the literature. Although several outstanding authorities, such as Orton and Janet, have been omitted, the author has presented the views of all of the schools of thought on the subject.

In reading this volume one is impressed with the widely divergent, authoritative, positive views on the cause, nature and treatment of stuttering. In the appendix the author describes briefly the procedure followed in his clinic in Detroit.

The book is well written, instructive and interesting. A bibliography is appended.

News and Comment

GENERAL NEWS

Physicians Certified by American Board of Pediatrics.—The following physicians were certified as specialists by the American Board of Pediatrics after the examinations in St. Louis and New York on Nov. 8 and 9:

Dr. Chester J. Antos, Jefferson City, Mo.; Dr. Stuart Lane Arey, Minneapolis; Dr. Hans C. S. Aron, Chicago; Dr. Katharine Howard Baird, Wauwatosa, Wis.; Dr. Felix P. Basch, Chicago; Dr. John H. Benward, Portland, Ore.; Dr. Mary Scarborough Boyden, Lawrence, Kan.; Dr. Rowine Hayes Brown, Chicago; Dr. John F. Burn, Butler, Pa.; Dr. Mollie Cholfin, Sacramento, Calif. (formerly Cleveland); Capt. Richard D. Cutter, Santa Ana, Calif. (formerly San Francisco); Dr. Parker Dooley, Chicago; Dr. Genevieve Delfs Ewing, Youngstown, Ohio; Lt. Herbert William Fink, San Diego, Calif. (formerly Detroit); Dr. Joseph Edward Ghory, Cincinnati; Dr. Evelyn Smith Harris, Minneapolis; Dr. Allan Janney Hill, Jr., New Orleans; Dr. Oliver W. Hosterman, Columbus, Ohio; Dr. Gerda B. Irving, Chicago; Capt. Philip J. Kozinn, Excelsior Springs, Mo. (formerly New York); Lt. Maurice W. Laufer, Galesburg, Ill. (formerly Yellow Springs, Ohio); Dr. Frederick H. Maurer, Peoria, Ill.; Dr. Martin G. Neely, Fairfield, Ala.; Dr. Richard Robert O'Toole, Pittsburgh; Dr. Glenn B. Patrick, Elkhart, Ind.; Capt. Joseph H. Patterson, Fort McPherson, Ga. (formerly Nashville, Tenn.); Lt. Edward B. Plattner, Fort McPherson, Ga. (formerly Chicago); Dr. Weldon A. Price, Arlington, Va.; Dr. Maryelda Rockwell, Clinton, Iowa; Dr. Iwan Rosenstern, Evanston, Ill.; Dr. George Wilbur Salmon, Houston, Texas (formerly St. Louis); Dr. Alice Schiff (name formerly Schiff-Goldstein), Los Angeles; Dr. Helmut P. G. Seckel, Chicago; Dr. Clark Workman Seely, Kansas City, Mo.; Dr. Francis Scott Smyth, San Francisco; Dr. Homer Fauquier Wier, Rockford, Ill.; Dr. Dorothy B. Wyvell, Dallas, Texas.

Directory of Pediatric Societies *

INTERNATIONAL

International Association of Preventive Pediatrics

President: Prof. S. Monrad, Dronning Louises Børnehospital, Copenhagen, Denmark.
Secretary: Dr. Daniel Oltramare, 15 Rue Lévrier, Geneva, Switzerland.

International Congress of Pediatrics

President: Dr. Henry F. Helmholz, Mayo Clinic, Rochester, Minn.
Secretary-Treasurer: Dr. Charles F. McKhann, University Hospital, Ann Arbor, Mich.
Canadian Committee:
Chairman: Dr. Alan Brown, Hospital for Sick Children, 67 College St., Toronto.
Secretary: Dr. H. P. Wright, 1509 Sherbrooke St. W., Montreal.
Place: Boston. Time: Postponed indefinitely.

International Congress for the Protection of Infancy

Secretary: Prof. G. B. Allaria, Corso Bramante 29, Torino 120, Italy.

FOREIGN

Argentine Pediatric Society of Buenos Aires

President: Dr. Martin Ramón Arana, 1809 Rodriguez Peña, Buenos Aires.
General Secretary: Dr. Alfredo Larguia, Cerrito 1179, Buenos Aires.

Associação Paulista de Medicina, Section on Pediatrics

President: Dr. Vicente Lara.
First Secretary: Dr. Armando de Arruda Sampaio.
Second Secretary: Dr. Paulo de Barros Franca, Av. Brigadeiro Luiz Antonio 393, 1° Andar, São Paulo, Brazil.

British Paediatric Association

President: Prof. L. G. Parsons, 58 Calthorpe Rd., Five Ways, Birmingham.
Secretary: Dr. Donald Paterson, 27 Devonshire Pl., London, W. 1.

Danish Pediatric Society

President: Dr. E. Lenstrup, Copenhagen.
Secretary: Dr. E. Gjørup, Dronning Louises Børnehospital, Copenhagen.

Nederlandische Vereeniging voor Kindergeneeskunde

President: Dr. J. H. G. Carstens, Servaasbolwerk 14ª, Utrecht.
Secretary: Dr. R. P. van de Kasteele, Laan van Poot 340, 's Gravenhage.
Place: Different places. Time: Three times a year.

Paediatrický Spolok na Slovensku

President: Dr. A. J. C. Chura, Lazaretská 11, Bratislava.
Secretary: Dr. P. Rados, Lazaretská 6, Bratislava.
Place: Pediatric Clinic, University Bratislava. Time: Six times a year.

Royal Society of Medicine, Section for the Study of Disease in Children

President: Dr. E. A. Cockayne, 98 Harley St., Lond W. 1, England.
Secretary: Dr. R. Lightwood, 86 Brook St., Lond W. 1, England.
Place: 1 Wimpole St., London. Time: Fourth Fri of each month, 4:15 p. m.

Palestine Jewish Medical Association, Section of Physicians of Children's Diseases

President: Prof. S. Rosenbaum, 26 Bialkstr., Tel A
Secretary: Dr. A. Brünn, 9 Maazestre, Tel Aviv.

Sociedad Cubana de Pediatria

President: Dr. Angel A. Aballí Arellano, 17 No. Vedado, Habana.
Secretary: Dr. Julio G. Cabrera Calderin, Hosp Mercedes L y 21 (Vedado), Box 2430, Habana.
Place: Cátedra de Clinica Infantil, Hospital Merce Habana. Time: Last Wednesday of every month.

Sociedad Mexicana de Pediatria

President: Dr. Fernando López Clares, 12/a. Mede 191, Mexico.
Secretary: Dr. Jesus Gómez Pagola, Versalles Mexico.

Sociedad Venezolana de Puericultura y Pediat

President: Dr. E. Santos Mendoza.
Secretary: Dr. P. Oropeza, Hospital de Niños, Cara

Société de Pédiatrie de Paris

President: Dr. B. Weill-Hallé, 49 Avenue Raym Poincare, Paris, France.
Secretary: Dr. Jean Hallé, 10 bis Rue Pré aux Cle Paris, France.
Place: Hôpital des Enfants Malades, 49 Rue de Sèv Time: 4:30 p. m., third Thursday of every month

Uruguyan Society of Pediatrics

President: Dr. Jose Alberto Praderi, Eduardo Acev 1132, Montevideo.
Secretary: Dr. Alfredo Ramon Guerra, Paysandú Montevideo.

NATIONAL

American Medical Association, Scientific Assembly, Section on Pediatrics

Chairman: Dr. John Aikman, 184 Alexander Rochester, N. Y.
Secretary: Dr. Gilbert J. Levy, 188 S. Bellevue Bl Memphis, Tenn.
Place: Philadelphia. Time: June 18-22, 1945.

American Academy of Pediatrics

President: Dr. Joseph S. Wall, 1864 Wyoming N. W., Washington, D. C.
Secretary: Dr. Clifford G. Grulee, 636 Church Evanston, Ill.

* Secretaries of societies are requested to furnish the information necessary to make this list complete and to keep it up to date.

American Hospital Association, Children's Hospital Section

airman: Dr. Joelle C. Hiebert, 299 Main St., Lewiston, Maine.
cretary: Dr. W. Franklin Wood, McLean Hospital, Waverly, Mass.

American Pediatric Society

esident: Dr. James L. Gamble, 300 Longwood Ave., Boston.
cretary-Treasurer: Dr. Hugh McCulloch, 325 N. Euclid Ave., St. Louis.

Canadian Society for the Study of Diseases of Children

esident: Dr. R. R. Struthers, 906 Drummond Medical Bldg., Montreal.
cretary-Treasurer: Dr. Elizabeth Chant Robertson, Hospital for Sick Children, Toronto.

Society for Pediatric Research

esident: Dr. Edward M. Bridge, 219 Bryant St., Buffalo, N. Y.
cretary: Dr. Mitchell I. Rubin, 1740 Bainbridge St., Philadelphia 46.

SECTIONAL

Intermountain Pediatric Society

esident: Dr. Eugene Smith, 385–24th St., Ogden, Utah.
cretary-Treasurer: Dr. W. C. Cheney, 837 Boston Bldg., Salt Lake City.
ace: Salt Lake City General Hospital. Time: First Thursday of each month, 8 p. m.

New England Pediatric Society

esident: Dr. Warren R. Sisson, 319 Longwood Ave., Boston.
cretary-Treasurer: Dr. James Marvin Baty, 1101 Beacon St., Brookline, Mass.
ace: Boston Medical Library. Time: Four meetings a year, occurring from September to May.

North Pacific Pediatric Society

esident: Dr. M. L. Bridgeman, 1020 S. W. Taylor St., Portland, Ore.
cretary: Dr. C. G. Ashley, 833 S. W. 11th Ave., Portland, Ore.

Northwestern Pediatric Society

esident: Dr. Arild E. Hansen, University of Minnesota, Minneapolis.
cretary-Treasurer: Dr. Albert V. Stoesser, 205 W. University Hospital, Minneapolis.
ace: Minneapolis, St. Paul, Duluth and Rochester. Time: January, April, July and October.

Rocky Mountain Pediatric Society

esident: Dr. G. R. Fisher, 23 E. Pikes Peak Ave., Colorado Springs, Colo.
cretary: Dr. Joseph H. Lyday, 1850 Gilpin St., Denver.

Southern Medical Association, Section of Pediatrics

airman: Dr. William Weston Jr., 1428 Lady St., Columbia, S. C.
cretary. Dr. Angus McBryde 604 W. Chapel Hill St., Durham, N. C.

STATE

Alabama Pediatric Society

President: Dr. Amas Gipson, 948 Forrest Ave., Gadsen.
Secretary-Treasurer: Dr. Ruth Berrey, 2021–6th Ave. N., Birmingham.

Arizona Pediatric Society

President: Dr. Vivian Tappan, San Clemente, Tucson.
Secretary: Dr. Hilda Kroeger, Arizona State Health Dept. (Maternal and Child Welfare Division), Phoenix.

Arkansas State Pediatric Association

Chairman: Dr. C. B. Billingsley, 1425 N. 11th St., Fort Smith.
Secretary: Dr. R. E. Weddington, 1425 N. 11th St., Fort Smith.

California State Medical Society, Section on Pediatrics

Chairman: Dr. William C. Deamer, University of California Hospital, San Francisco.
Secretary: Dr. Charles W. Leach, 2000 Van Ness Ave., San Francisco.

Florida State Pediatric Society

President: Dr. Ludo Von Meysenbug, Box 3356, Daytona Beach.
Secretary: Dr. Robert Blessing, 409 Blount Bldg., Ft. Lauderdale.
Place: Concurrent with state association meeting at time of convention.

Georgia Pediatric Society

President: Dr. T. F. Davenport, 104 Ponce de Leon Ave. N. E., Atlanta.
Secretary-Treasurer: Dr. Don F. Cathcart, 478 Peachtree St. N. E., Atlanta.

Hezekiah Beardsley Pediatric Club of Connecticut

President: Dr. Edward T. Wakeman, 129 Whitney Ave., New Haven.
Secretary: Dr. Herman Yannet, Southbury Training School, Southbury.
Time: Three meetings a year.

Illinois State Medical Society, Section on Pediatrics

Chairman: Dr. Craig D. Butler, 715 Lake St., Oak Park.
Secretary: Dr. A. J. Fletcher, 139 N. Vermilion, Danville.

Indiana State Pediatric Society

President: Dr. K. T. Knode, 1105 E. Jefferson Bldg., South Bend.
Secretary-Treasurer: Dr. Mathew Winters, 621 Hume Mansur Bldg., Indianapolis.
Time: Two meetings a year.

Iowa Pediatric Society

President: Dr. Mark L. Floyd, Children's Hospital, Iowa City.
Secretary-Treasurer: Dr. James Dunn, Davenport Bank Bldg., Davenport.

MEDICAL SOCIETY OF STATE OF NEW YORK, SECTION ON PEDIATRICS

Chairman: Dr. A. Clement Silverman, 608 E. Genesee St., Syracuse.
Secretary: Dr. Albert G. Davis, 307 Gas and Electric Bldg., Utica.

MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA, PEDIATRIC SECTION

Chairman: Dr. Elwood W. Stitzel, 403 Central Trust Bldg., Altoona, Pa.
Secretary: Dr. P. F. Lucchesi, Philadelphia Hospital, Philadelphia.

MICHIGAN STATE MEDICAL SOCIETY, PEDIATRIC SECTION

Chairman: Dr. Charles F. McKhann, University Hospital, Ann Arbor.
Secretary: Dr. Mark F. Osterlin, Central Michigan Children's Clinic, Traverse City.

MISSISSIPPI STATE PEDIATRIC SOCIETY

President: Dr. Harvey F. Garrison Jr., 315 E. Capitol Pl., Jackson.
Secretary: Dr. Guy Verner, 126 N. Congress St., Jackson.

NEBRASKA PEDIATRIC SOCIETY

President: Dr. John L. Gedgoud, University of Nebraska Hospital, Omaha.
Secretary-Treasurer: Dr. Gerald C. ONeil, 640 City National Bank Bldg., Omaha.
Place: As announced by committee. Time: Third Thursday of each month from October to June, inclusive. Dinner at 6 p. m.

NEW HAMPSHIRE PEDIATRIC SOCIETY

President: Dr. MacLean J. Gill, 14 N. State St., Concord.
Secretary-Treasurer: Dr. Ursula G. Sanders, 46 Pleasant St., Concord.
Time: Twice yearly.

NORTH CAROLINA PEDIATRIC SOCIETY

President: Dr. Arthur H. London, 1105 W. Main St., Durham.
Secretary: Dr. Jay M. Arena, 604 W. Chapel Hill St., Durham.

OKLAHOMA STATE PEDIATRIC SOCIETY

President: Dr. Ben H. Nicholson, 301 N. W. 12th St., Oklahoma City.
Secretary: Dr. Luvern Hays, 108 W. 6th St., Tulsa.
Place: Oklahoma Club. Time: 6:30 p. m., fourth Friday of each alternate month from September to May, inclusive.

SOUTH CAROLINA PEDIATRIC SOCIETY

President: Dr. Lonita Boggs, 301 E. Coffee St., Greenville.
Secretary-Treasurer: Dr. Hilla Sheriff, Wade Hampton Office Bldg., Columbia.

TEXAS PEDIATRIC SOCIETY

President: Dr. F. H. Lancaster, 4409 Fannin St., Houston.
Secretary-Treasurer: Dr. John E. Ashby, 3610 Fairmount Ave., Dallas.

VIRGINIA PEDIATRIC SOCIETY

President: Dr. L. E. Sutton Jr., Medical College Hospital, Richmond.
Secretary: Dr. Emily Gardner, 1100 W. Franklin St., Richmond.

WEST VIRGINIA STATE MEDICAL SOCIETY, SECTION ON PEDIATRICS

President: Dr. Andrew Amick, 1021 Quarrier S Charleston.
Secretary: Dr. A. A. Shawkey, Professional Bld Charleston.

LOCAL

ACADEMY OF MEDICINE OF CLEVELAND PEDIATRIC SECTION

Chairman: Dr. J. D. Nourse, 10515 Carnegie Av Cleveland.
Secretary: Dr. I. B. Silber, 10465 Carnegie Av Cleveland.
Place: Cleveland Medical Library Bldg. Time: O tober, December, February and April.

ACADEMY OF MEDICINE, TORONTO, SECTION OF PEDIATRICS

President: Dr. I. Nelles Silverthorne, 170 St. Geor St., Toronto, Canada.
Secretary: Dr. G. P. Hamblin, 2333 Bloor St. W Toronto, Canada.

BRONX PEDIATRIC SOCIETY

President: Dr. Harry J. Cohen, 1975 Walton Av New York.
Secretary: Dr. Walter Levy, 12 E. 88th St., New Yor
Place: Concourse Plaza Hotel, 161st St., and Gra Concourse. Time: Second Wednesday of each mont except June, July, August and September.

BROOKLYN ACADEMY OF PEDIATRICS

President: Dr. Harry A. Naumer, 37–8th Av Brooklyn.
Secretary: Dr. Lewis A. Koch, 62 Pierrepont S Brooklyn.
Place: Granada Hotel. Time: Fourth Wednesday October, November, February, March and April.

BUFFALO PEDIATRIC SOCIETY

President: Dr. A. Wilmot Jacobsen, 187 Bryant S Buffalo N. Y.
Secretary: Dr. Richard A. Downey, 86 Forest Av Buffalo, N. Y.
Place: Children's Hospital, 219 Bryant St. Time: 8: p. m., first Monday of each month from Septemb to June.

CENTRAL NEW YORK PEDIATRIC CLUB

President: Dr. Edward J. Wynkoop, 501 James S Syracuse.
Secretary: Dr. Frank J. Williams, 58 S. Swan S Albany.
Places:: Various cities in New York. Time: Thi Tuesday of April and September.

CHICAGO PEDIATRIC SOCIETY

President: Dr. Morley D. McNeal, 2 N. Sheridan R Highland Park, Ill.
Secretary: Dr. Henry G. Poncher, 1819 W. Polk S Chicago.
Place: Children's Memorial Hospital, 710 Fullert Ave. Time: Third Tuesday of each month, Octob to May, Inclusive.

Cincinnati Pediatric Society

ecretary: Dr. T. Selkirk, 3530 Reading Rd., Cincinnati.
lace: Children's Hospital, Elland Ave., Cincinnati. Time: On call.
resident: Dr. Lloyd K. Felter, 3144 Jefferson Ave., Cincinnati.

Dallas Pediatric Society

resident: Dr. John E. Ashby, 3610 Fairmount Ave., Dallas, Texas.
ecretary-Treasurer: Dr. Gladys J. Fashena, 4585 Belfort, Dallas, Texas.
lace: Bradford Baby Hospital. Time: 1 p. m., second and fourth Saturdays of each month.

Detroit Pediatric Society

resident: Dr. John J. Pollack, 650 Maccabees Bldg., Detroit, Mich.
ecretary: Dr. Philip J. Howard, 2799 W. Grand Blvd., Detroit, Mich.
lace: Wayne County Medical Society. Time: 8:30 p. m., first Wednesday of each month from October to June, inclusive.

Fulton County Medical Society, Pediatrics Section (Atlanta, Ga.)

hairman: Dr. Don F. Cathcart, 478 Peachtree St. N. E., Atlanta.
ecretary: Dr. Harry Lange, 478 Peachtree St., N. E., Atlanta.
lace: Academy of Medicine, 38 Prescott St. N. E. Time: Second Thursday of each month from October to April, 8 p. m.

Houston Pediatric Society

resident: Dr. Raymond Cohen, 2300 Caroline St., Houston, Texas.
ecretary: Dr. Betty Moody, 526 Richmond Rd., Houston, Texas.
lace: College Inn, Houston. Time: Fourth Monday of each month.

Kansas City (Missouri) Pediatric Society

resident: Dr. Edwin H. Schorer, 1103 Grand Ave., Kansas City.
ecretary: Dr. H. E. Petersen, Kirkpatrick Bldg., St. Joseph, Mo.
lace: Kansas City General Hospital. Time: On call.

Los Angeles County Medical Association, Pediatric Section

resident: Dr. Oscar Reiss, 2200 W. 3d St., Los Angeles.
ecretary-Treasurer: Dr. Elena Boder, 1830½ Lucille Ave., Los Angeles.
lace: Los Angeles County Medical Headquarters, 1925 Wilshire Blvd. Time: Second Monday of February, April, June, October and December.

Medical Society of the County of Kings and the Academy of Medicine of Brooklyn, Pediatric Section

resident: Dr. Abraham M. Litvak, 1145 Eastern Parkway, Brooklyn.
ecretary: Dr. Harold Levy, 750 St. Marks Ave., Brooklyn.
lace: 1313 Bedford Ave., Brooklyn. Time: 9:00 p. m., fourth Monday of each month, October to April, inclusive.

Medical Society of the County of Queens, Inc., Section on Pediatrics

Chairman: Dr. Meyeron Coe, 217-02-91st Ave., Queens Village, N. Y.
Secretary-Treasurer: Dr. Edith A. Mittell, 144-38th Ave., Flushing, N. Y.
Place: Queens County Medical Bldg., Forest Hills, N. Y. Time: Third Monday of October, January, March and May.

Medical Society of the District of Columbia, Section on Pediatrics

President: Dr. Harry A. Spigel, 2647 Connecticut Ave., Washington, D. C.
Secretary-Treasurer: Dr. Perry W. Gard, 2520 Woodley Rd., Washington, D. C.
Place: Medical Society Bldg., 1718 M St. N. W. Time: 8 p. m., fourth Thursday of every month.

Memphis Pediatric Society

President: Dr. F. T. Mitchell, 376 S. Bellevue Ave., Memphis, Tenn.
Secretary-Treasurer: Dr. Harry Jacobson, 1193 Madison Ave., Memphis, Tenn.
Place: John Gaston Hospital. Time: Quarterly.

Milwaukee Pediatric Society

President: Dr. M. G. Peterman, 411 E. Mason St., Milwaukee 2.
Secretary-Treasurer: Dr. B. J. Malnekoff, 3213 N. Marietta Ave., Milwaukee.
Place: Milwaukee Athletic Club. Time: Second Wednesday of each alternate month, beginning with February.

New York Academy of Medicine, Section of Pediatrics

Chairman: Dr. Howard Craig, 175 E. 79th St., New York.
Secretary: Dr. Alfred E. Fischer, 73 E. 90th St., New York.
Place: New York Academy of Medicine, 2 E. 103d St. Time: Second Thursday of each month from October to May, inclusive. 8:30 p. m.

Northern California Affiliates

President: Dr. Crawford Bost, 400 Post St., San Francisco.
Secretary: Dr. William A. Reilly, 384 Post St., San Francisco.
Time: Second Thursday of September, November, January, March and May.

Oklahoma City Pediatric Society

President: Dr. William M. Taylor, 1200 N. Walker St., Oklahoma City.
Secretary: Dr. G. R. Felts, 625 N. W. 10th St., Oklahoma City.
Place: Oklahoma Club. Time: Third Thursday of each month.

Philadelphia Pediatric Society

President: Dr. Carl Fischer, Greene and Coulter Sts., Germantown, Philadelphia.
Secretary: Dr. Sherman Little, 1740 Bainbridge St., Philadelphia.
Place: College of Physicians, 19 S. 22d St. Time: Second Tuesday in January, March, May and November.

Pittsburgh Pediatric Society

President: Dr. John D. Sturgeon Jr., 22 N. Gallatin Ave., Uniontown, Pa.

Secretary-Treasurer: Dr. C. J. Stoecklein, Medical Arts Bldg., Pittsburgh.

Place: Pittsburgh Academy of Medicine. Time: Second Friday, alternate month from October to June, inclusive.

Richmond Pediatric Society

President: Dr. Stanley Meade, 913 Floyd Ave., Richmond, Va.

Secretary-Treasurer: Dr. Louise Galvin, 214 S. Boulevard, Richmond, Va.

Place: Richmond Academy of Medicine, 1200 E. Clay St. Time: 8 p. m., third Thursday of each month, except June, July and August.

Rochester Pediatric Society

President: Dr. Herbert Soule, 122 Rutgers St., Rochester, N. Y.

Secretary-Treasurer: Dr. Jerome Glaser, 300 S. Goodman St., Rochester, N. Y.

Place: Rochester Academy of Medicine or arrangement by program committee. Time: Third Friday of each month from October to May.

St. Louis Pediatric Society

President: Dr. Jerome Diamond, 508 N. Grand Ave., St. Louis.

Secretary-Treasurer: Dr. Mary A. McLoon, 408 Humboldt Bldg., St. Louis.

Place: St. Louis Medical Society Bldg. Time: First Friday of each month from November to June.

Seattle Pediatric Society

President: Dr. Frederick B. Joy, Stimson Bldg., Seat
Secretary: Dr. Sherod M. Billington, Medical Den
Bldg., Seattle.

Place: College Club. Time: Third Friday of e
month from September to June at 6:30 p. m.

Southwestern Pediatric Society

President: Dr. Jeanette Harrison, 1136 W. 6th S
Los Angeles.

Secretary: Dr. Henry F. Gallagher, 1930 Wilshi
Blvd., Los Angeles.

Place: Jonathan Club of Los Angeles. Time: Fi
Wednesday in January, March, May, September a
November.

University of Michigan Pediatric and Infectious Disease Society

President: Dr. Campbell Harvey, 35 W. Huron S
Pontiac, Mich.

Secretary: Dr. Harry A. Towsley, University of Mi
igan, Department of Pediatrics and Communica
Diseases, Ann Arbor, Mich.

Westchester County Medical Society, Pediatric Section (New York)

President: Dr. John B. Ahouse, 27 Ludlow St., Yonke
N. Y.

Secretary-Treasurer: Dr. Elvira Ostlund, 64 Highla
Rd., Rye, N. Y.

Place: Grasslands Hospital, Valhalla, N. Y. Tim
Third Thursday in October, December, February a
April.

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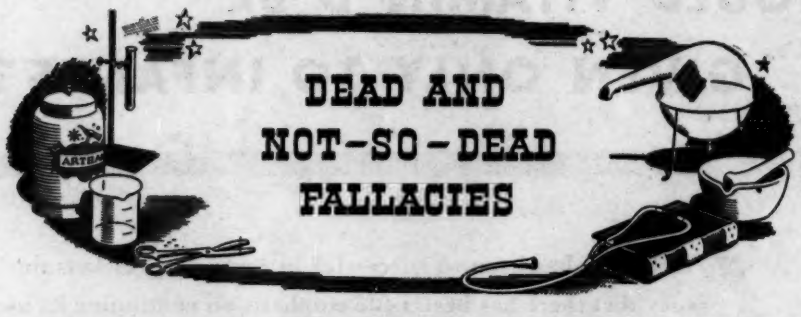

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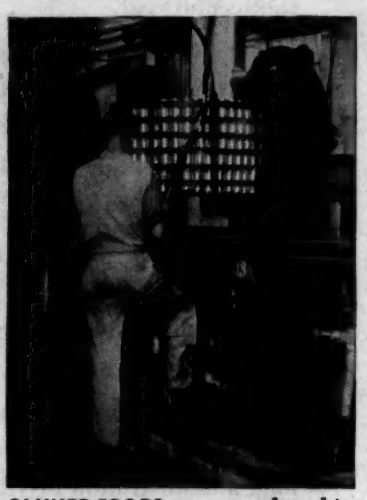

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1. "Cereal should introduce a baby to the flavor of natural grains."

2. "Cereal should supply extra Vitamin B_1 and iron to guard against deficiencies in the infant diet."

3. "Natural fortifying substances are preferable to pure chemicals, since they contain extra minerals, proteins, and still other as yet unknown nutrients."

4. "Mothers appreciate the convenience of a pre-cooked baby's cereal. Moderate cost is another important feature."

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2. Clapp's Instant Cereal supplies 2½ times as much Vitamin B_1, 3 times as much iron as unfortified home-cooked cereals.

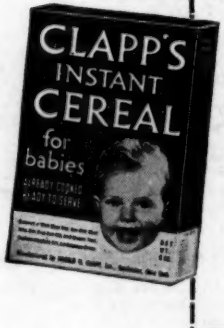
3. The vitamin and mineral content of Clapp's Instant Cereal is increased by important natural substances such as wheat germ, dry skim milk, and brewers' yeast.

4. Clapp's Instant Cereal is *already* cooked. Formula or milk may be added right in the serving dish. Costs just about 1¢ a serving.

Clapp's Baby Cereals

EVERY OUNCE OF CLAPP'S INSTANT CEREAL GIVES A BABY THIS:

Thiamin, *0.3 mg.*
Iron, *6 mg.*
Copper, *0.6 mg.*
Carbohydrate, *20.2 gm.*
Calories, *102*
Riboflavin, *0.18 mg.*
Calcium, *96 mg.*
Protein, *4.5 gm.*
Fat, *0.3 gm.*
Ash, *1.1 gm.*



FOR PROFESSIONAL SAMPLES, MAIL THIS COUPON

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3:15 P. M. Airway is still open. Benzedrine Inhaler produces a shrinkage equal to, or greater than, that of ephedrine.

4:00 P. M. Two hours after treatment, shrinkage persists. Benzedrine Inhaler shrinkage lasts 17% longer than that of ephedrine.

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In reporting their carefully controlled investigation of vasoconstrictive drugs, Butler and Ivy state that inhalers and sprays are preferable to nasal drops, and are—in most cases—"the better means of nasal medication."

Arch. Otolaryng., 39:109-123, 1944.

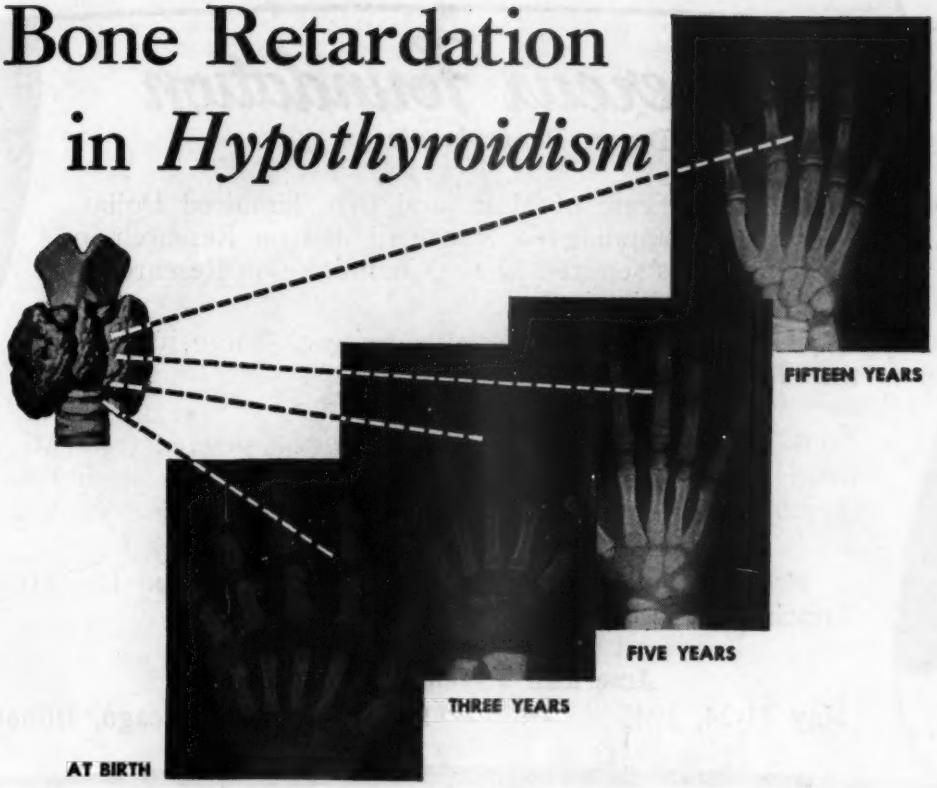
Each Benzedrine Inhaler is packed with racemic amphetamine, S.K.F., 200 mg.; oil of lavender, 60 mg.; and menthol 10 mg.

Smith, Kline & French Laboratories, Philadelphia, Pa.

Benzedrine Inhaler

Rapid, Complete and Prolonged Shrinkage

Bone Retardation in *Hypothyroidism*



NOWADAYS, the less marked degrees of thyroid deficiency are encountered more frequently than are frank myxedema or cretinism. The diagnosis of these milder syndromes often calls for considerable clinical acumen plus laboratory procedures. In children, the difficulty of executing a reliable basal metabolism determination further complicates the problem.

For this reason, Engelbach and others have emphasized the importance of a study of bone development, since in hypothyroidism the bone age tends to lag behind the chronologic age.

But once the diagnosis is established, uniformity and standardization of the thyroid medication are of paramount importance in the mild as in the severe cases. For this reason it is sound practice to specify "Armour" whenever ordering or prescribing thyroid.

From the very earliest days of thyroid therapy, Armour has spared no efforts in producing thyroid preparations of dependable, unvarying potency. It was first to recognize and institute methods for overcoming the regional and seasonal variation in animal thyroid. In the preparation of THYROID *Armour*, the selected glands are chosen carefully by geographic areas where a relatively stable proportion exists between thyroxin and the other organic iodine compounds. The desiccated glands are assayed and then blended to fixed standards—a method also instituted by The Armour Laboratories, and made possible by Armour's tremendous supply of raw material.

Have confidence in the preparation you prescribe . . . Specify ARMOUR

℞ *Thyroid Armour*

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will present a Certificate of Merit and Five Hundred Dollar Award for the outstanding paper contributed on Research in Child Psychiatry, as selected by the Committee on Research of the American Psychiatric Association.

The Devereux Schools cordially invite all those interested in this field to participate and to submit papers by March 1. Papers will be returned to contestants.

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Presentation will be made at the Devereux Invitation Luncheon held during the meeting of the

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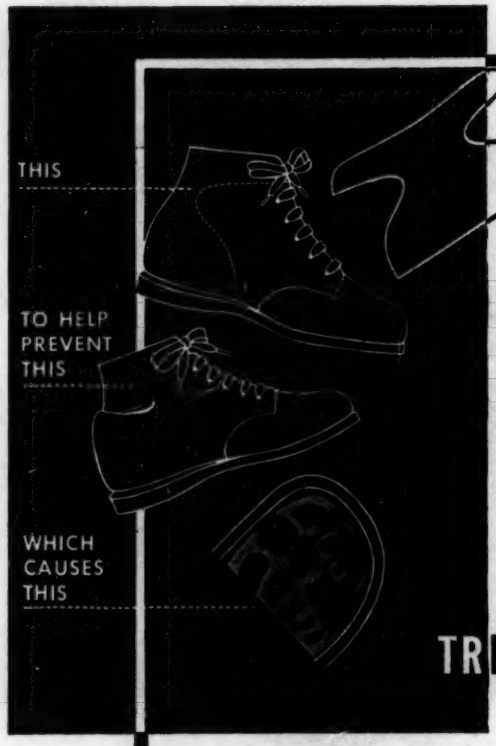

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A powdered, modified milk product especially prepared for infant feeding, made from tuberculin tested cow's milk (casein modified) from which part of the butter fat is removed and to which has been added lactose, olive oil, cocoanut oil, corn oil and fish liver oil concentrate.

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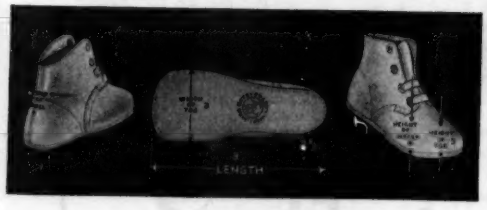
ON HIS
65,000 MILE WALK
IS A GRAVE RESPONSIBILITY
The First Shoe Must Be the Right Shoe!



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when the daily feedings are prepared from milk properly modified with

Mellin's Food

It has been observed, over a long period of years that constipation is frequently the underlying cause of a slow gain in weight, loss of appetite, restlessness and a generally uncomfortable baby.

It has also been observed that such indications of faulty adjustment of feeding formulas are rare among babies where the nourishment consists of milk modified with Mellin's Food and it is the significant picture that prompts a request for physicians' consideration of Mellin's Food whenever called upon to advise some means to relieve this annoying condition.

Formulas for Infant Feeding arranged to meet the requirements of normal infants furnished to physicians on request.

Samples of Mellin's Food will also be sent if desired

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12. Dextri-Maltose is tested routinely to check the keeping quality of prepared feedings held in refrigeration for 24 hours.

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